FIGURE 1a

Rose 8009
sh 1 of 61

PRIOR ART

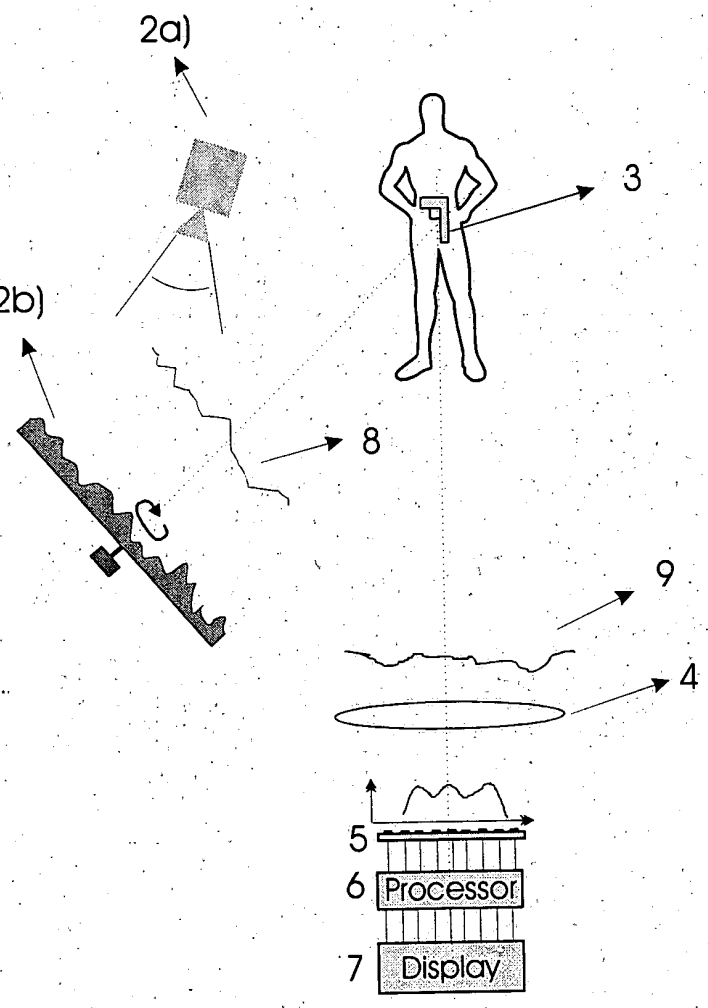


FIGURE 1b

Rose 8009
Sh 2 of 6

PRIOR ART

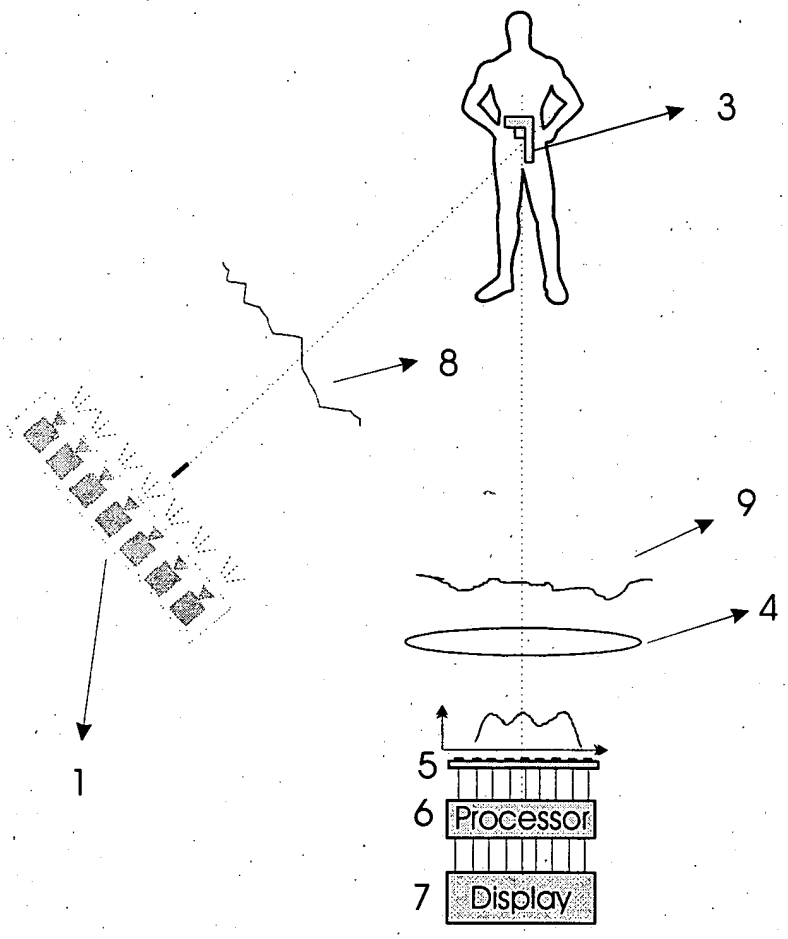


FIGURE 1c

PRIOR ART

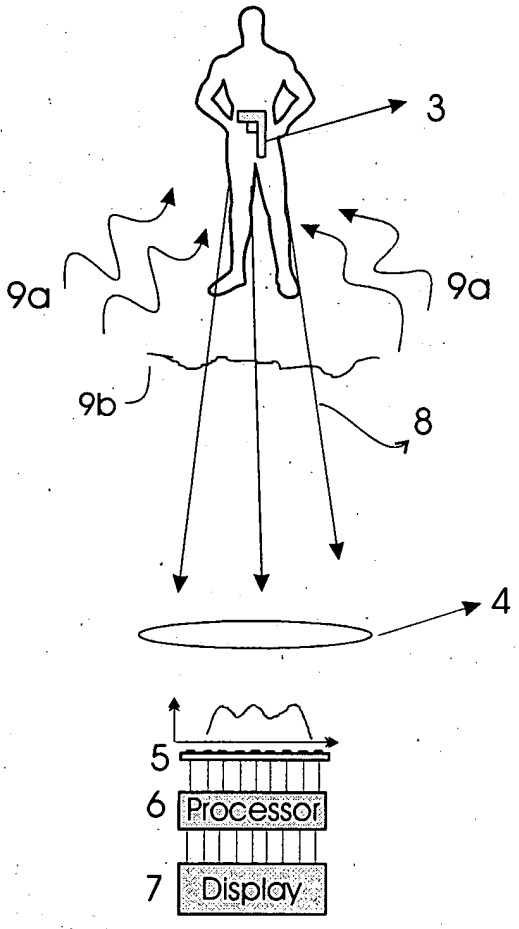


FIGURE 2

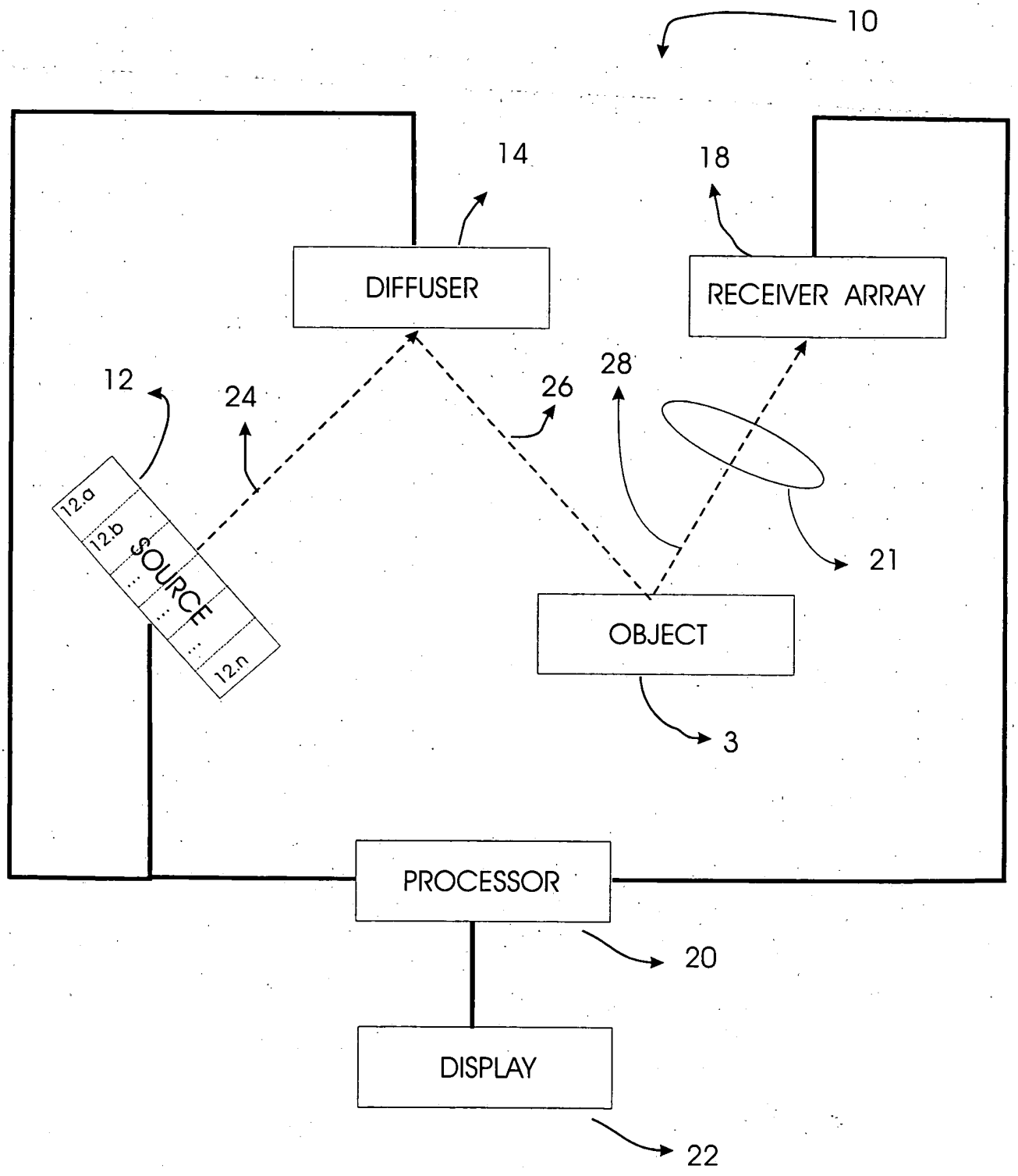

10
14
18
DIFFUSER
RECEIVER ARRAY
12
24
26
28
12.a
12.b
SOURCE
12.n
21
OBJECT
3
PROCESSOR
20
DISPLAY
22

FIGURE 3a

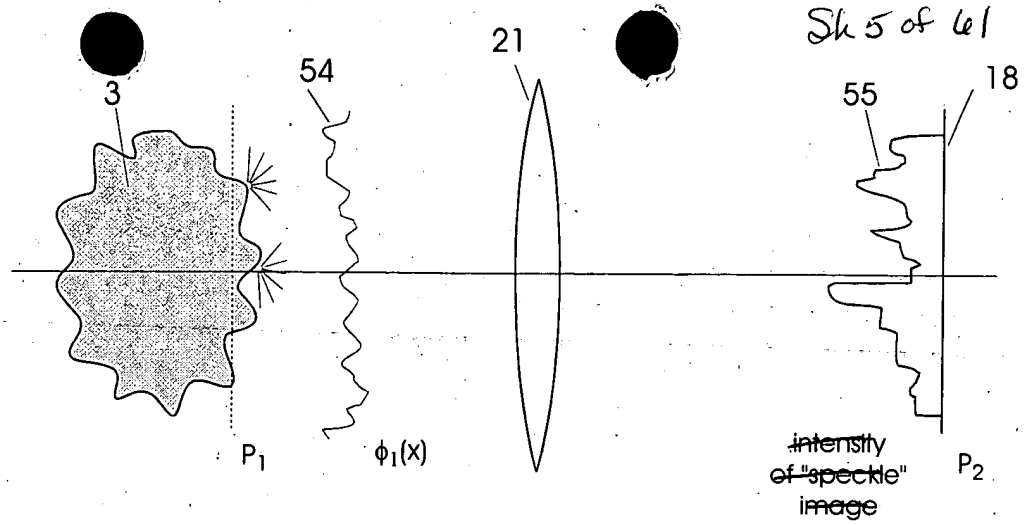


FIGURE 3b

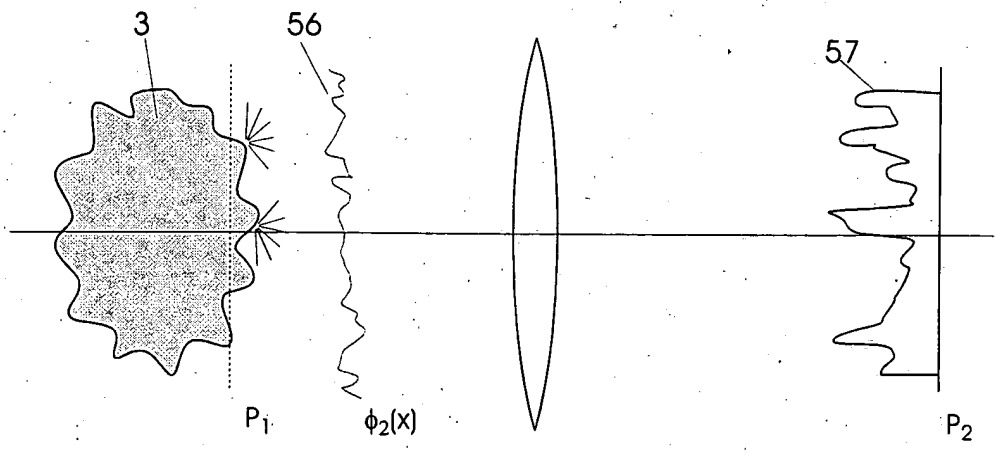


FIGURE 3c

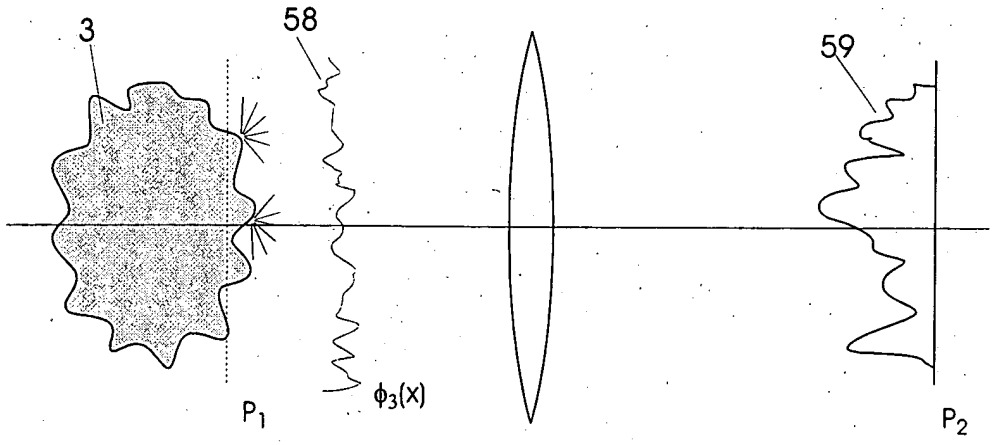


FIGURE 3d

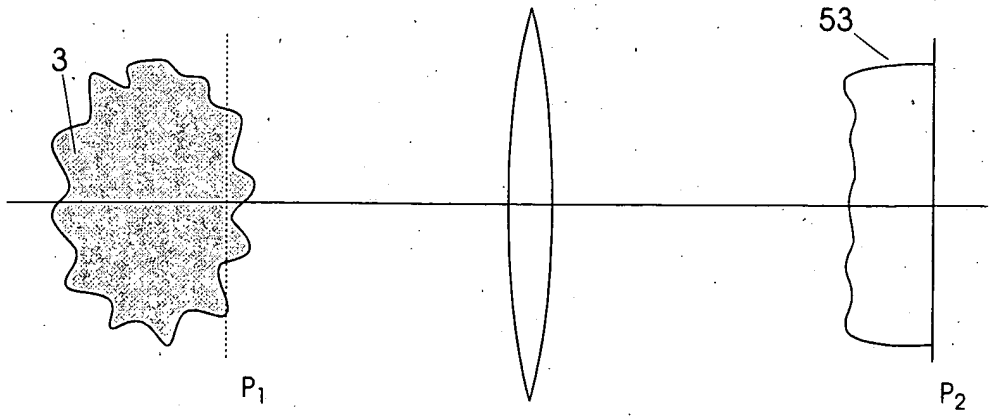


FIGURE 4a

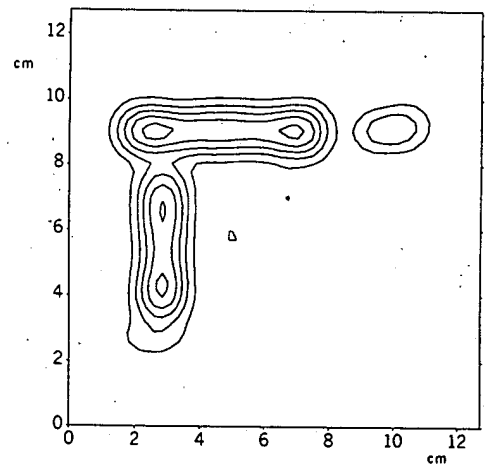


FIGURE 4b

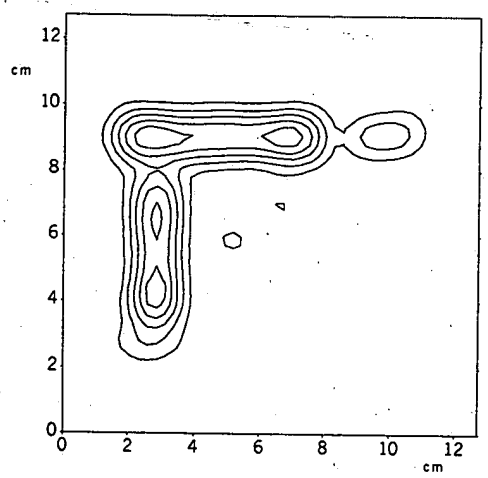


FIGURE 4c

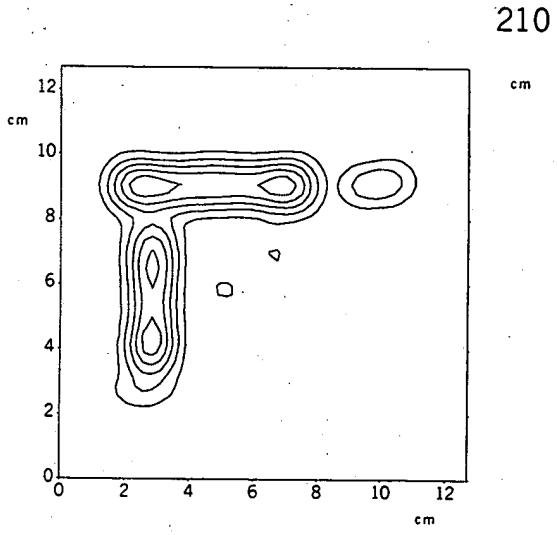
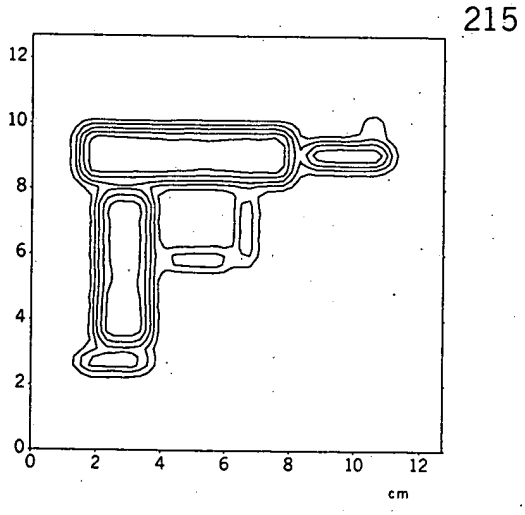


FIGURE 4d



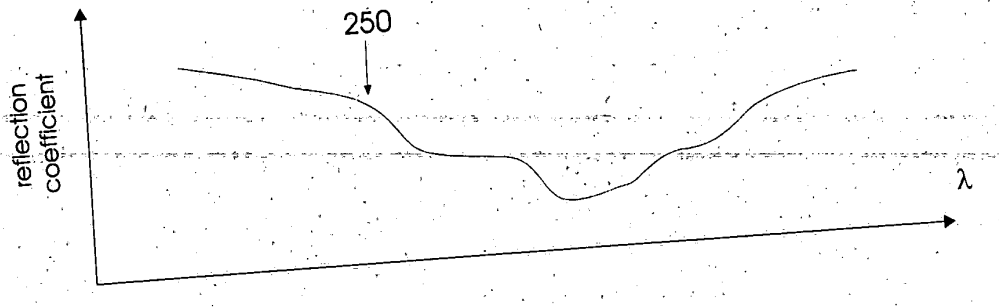


Figure 5a

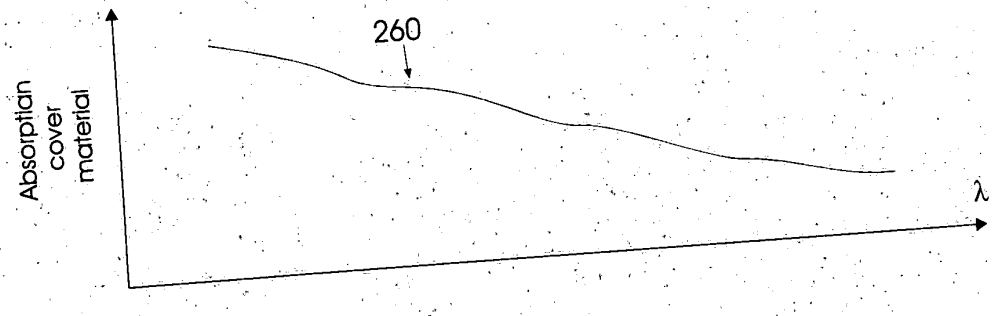


Figure 5b

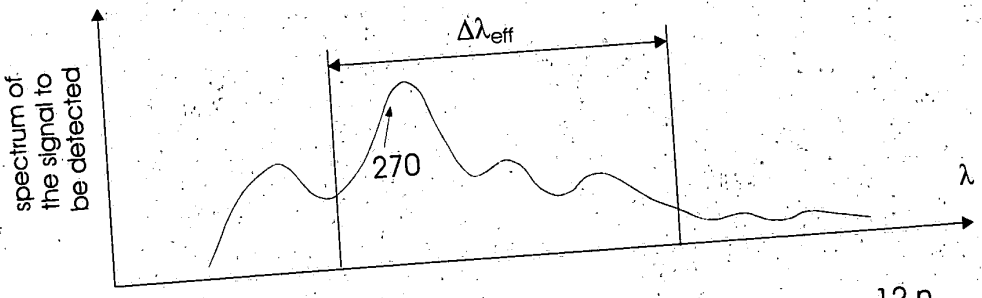


Figure 5c

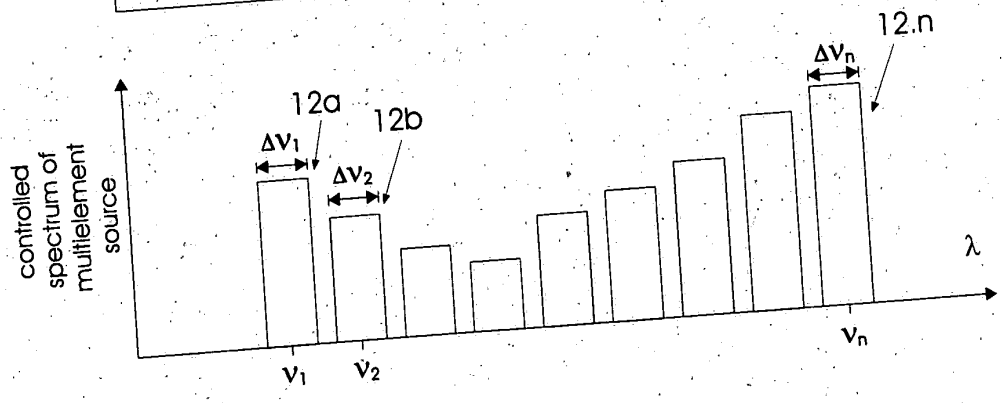


Figure 5d

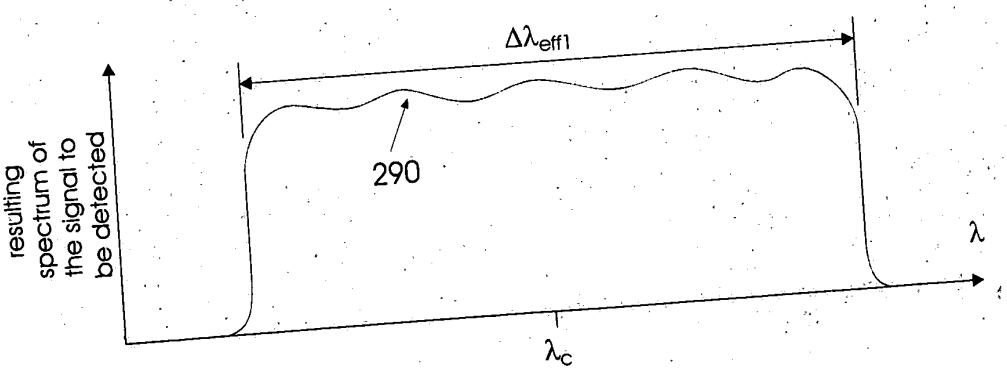


Figure 5e

FIGURE 6

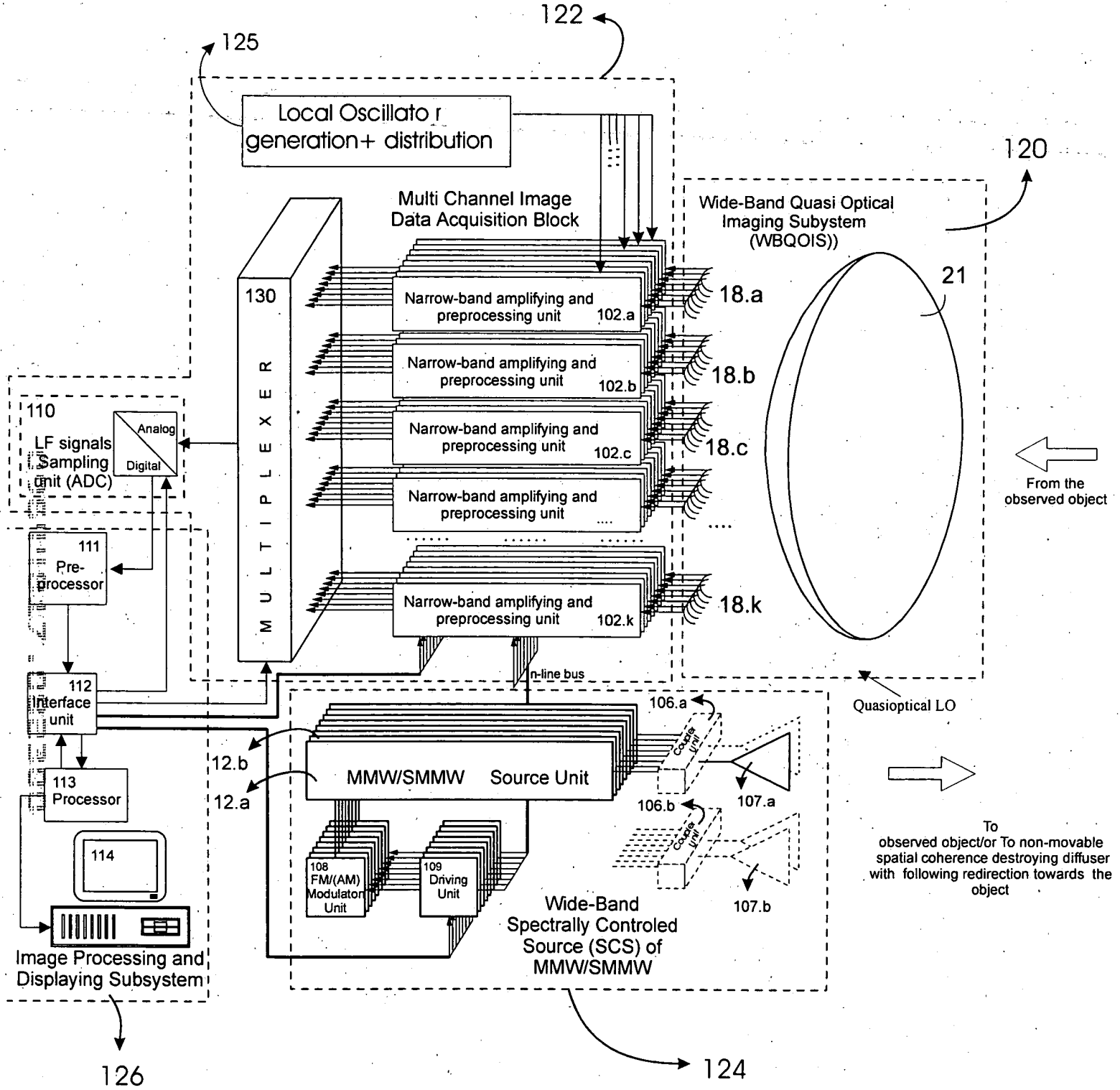

122
125
Local Oscillato r generation+ distribution
120
Multi Channel Image Data Acquisition Block
Wide-Band Quasi Optical Imaging Subsystem (WBQOIS))
130
MULTIPLEXER
Narrow-band amplifying and preprocessing unit 102.a
Narrow-band amplifying and preprocessing unit 102.b
Narrow-band amplifying and preprocessing unit 102.c
Narrow-band amplifying and preprocessing unit ....
Narrow-band amplifying and preprocessing unit 102.k
18.a
18.b
18.c
....
18.k
21
110
LF signals Sampling unit (ADC)
Analog
Digital
111 Pre-processor
112 Interface unit
113 Processor
114
Image Processing and Displaying Subsystem
126
n-line bus
Quasioptical LO
From the observed object
106.a
106.b
Code Unit
107.a
107.b
12.a
12.b
MMW/SMMW Source Unit
108 FM/(AM) Modulator Unit
109 Driving Unit
Wide-Band Spectrally Controled Source (SCS) of MMW/SMMW
124
To observed object/or To non-movable spatial coherence destroying diffuser with following redirection towards the object

FIGURE 7a

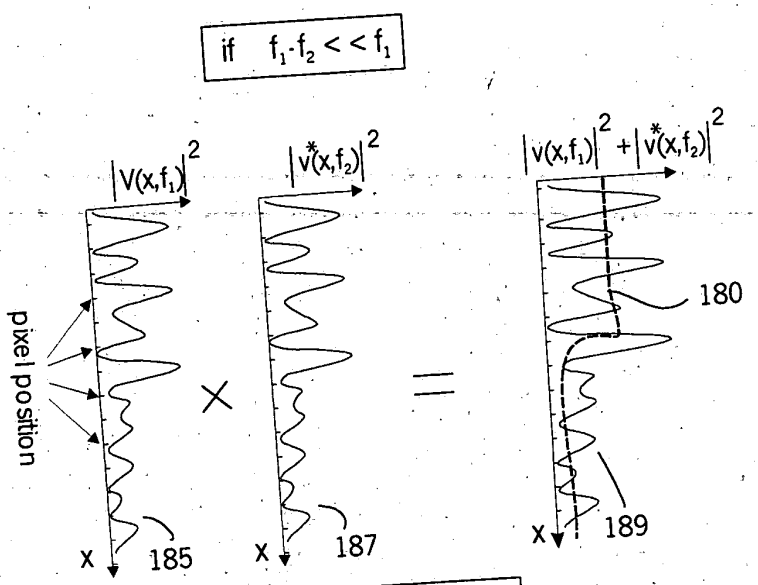


FIGURE 7b

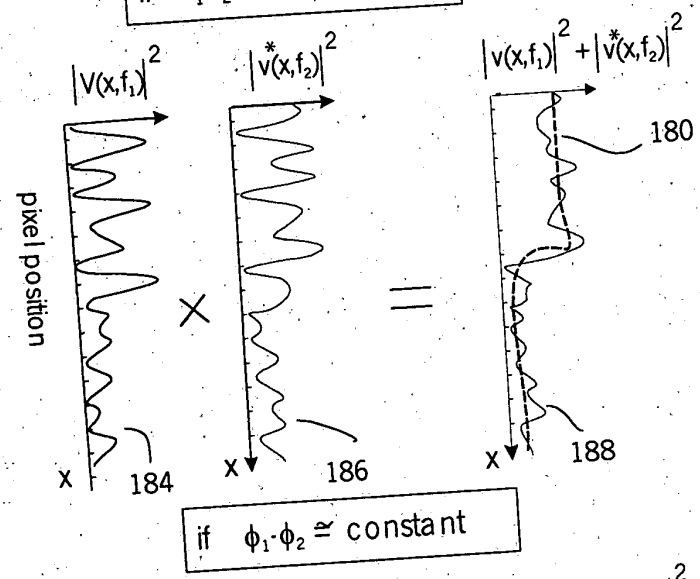


FIGURE 7c

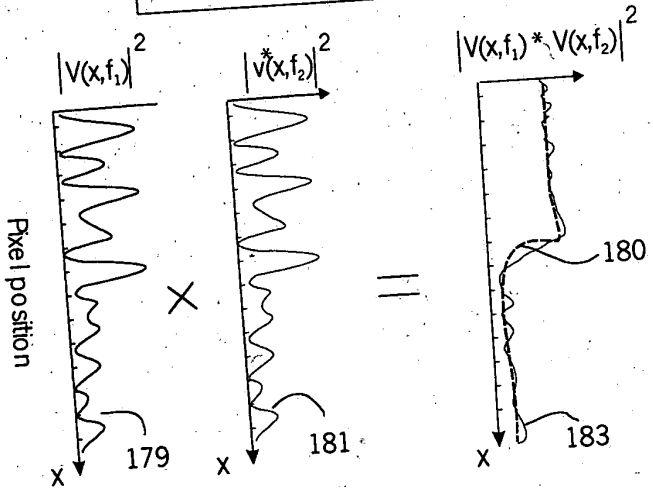


FIGURE 8

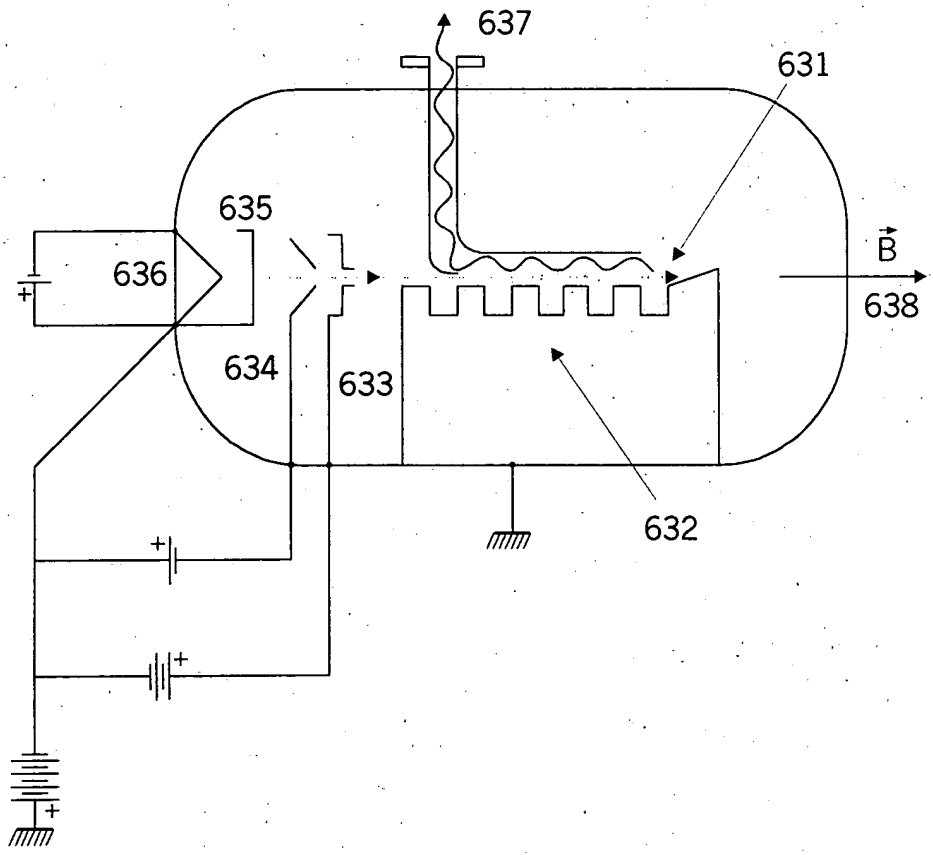


FIGURE 9.a_

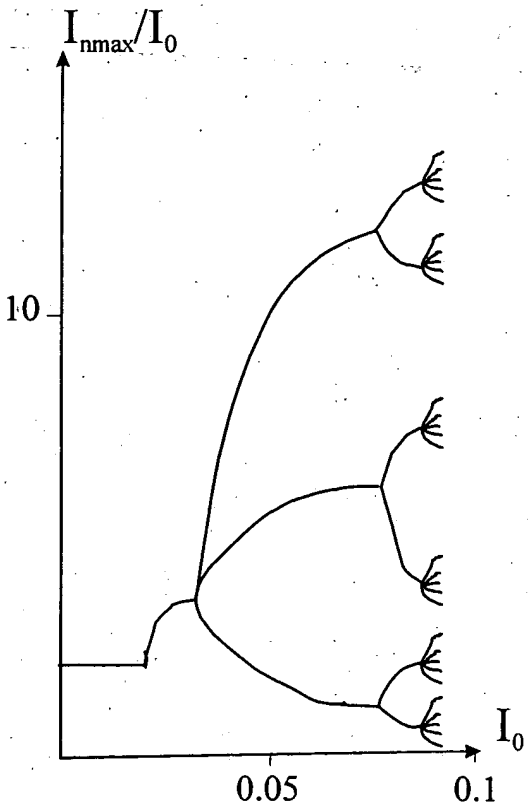


FIGURE 9.b

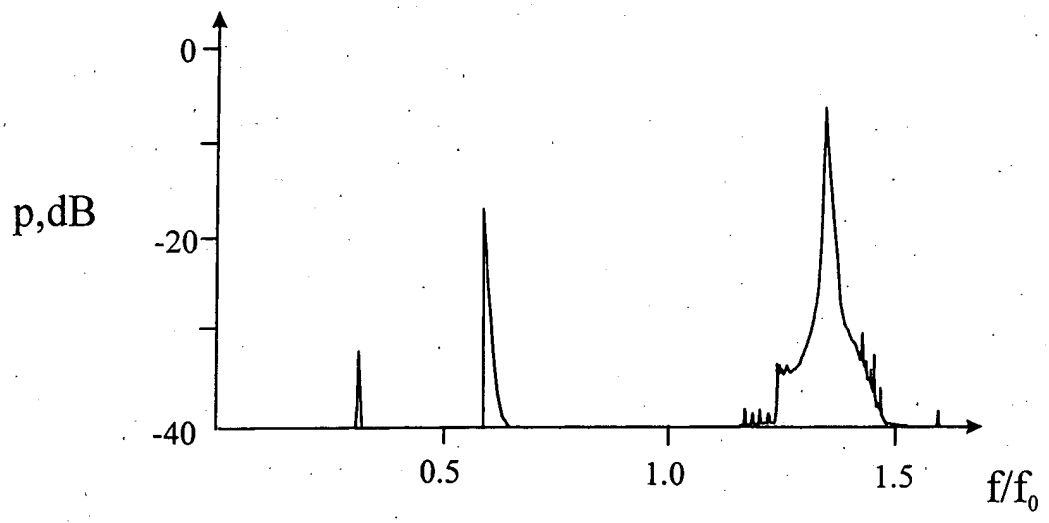


FIGURE 10

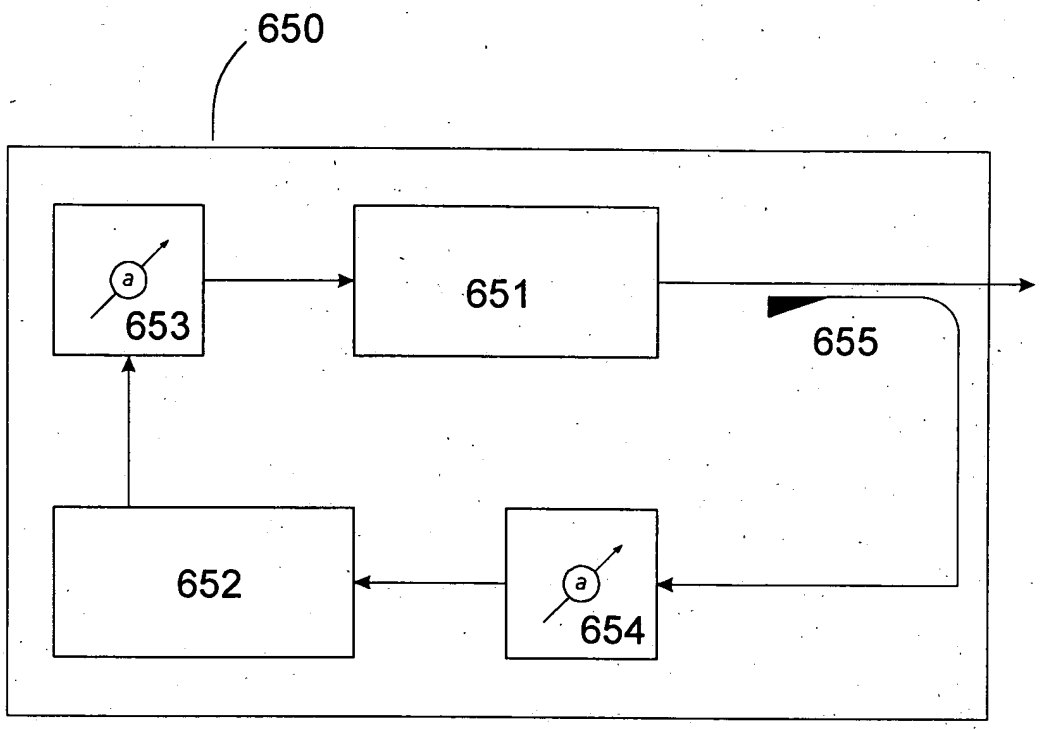


FIGURE 11a

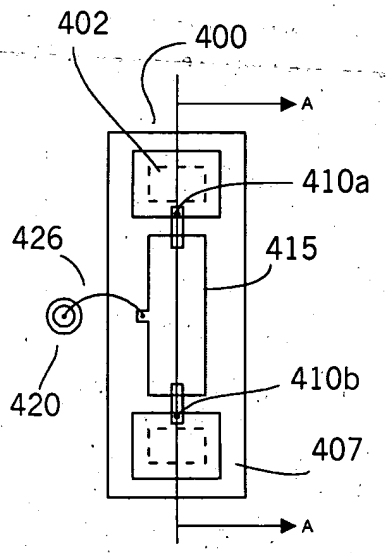


FIGURE 11b

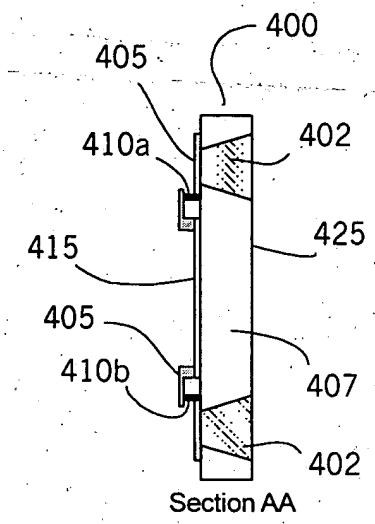


FIGURE 11c

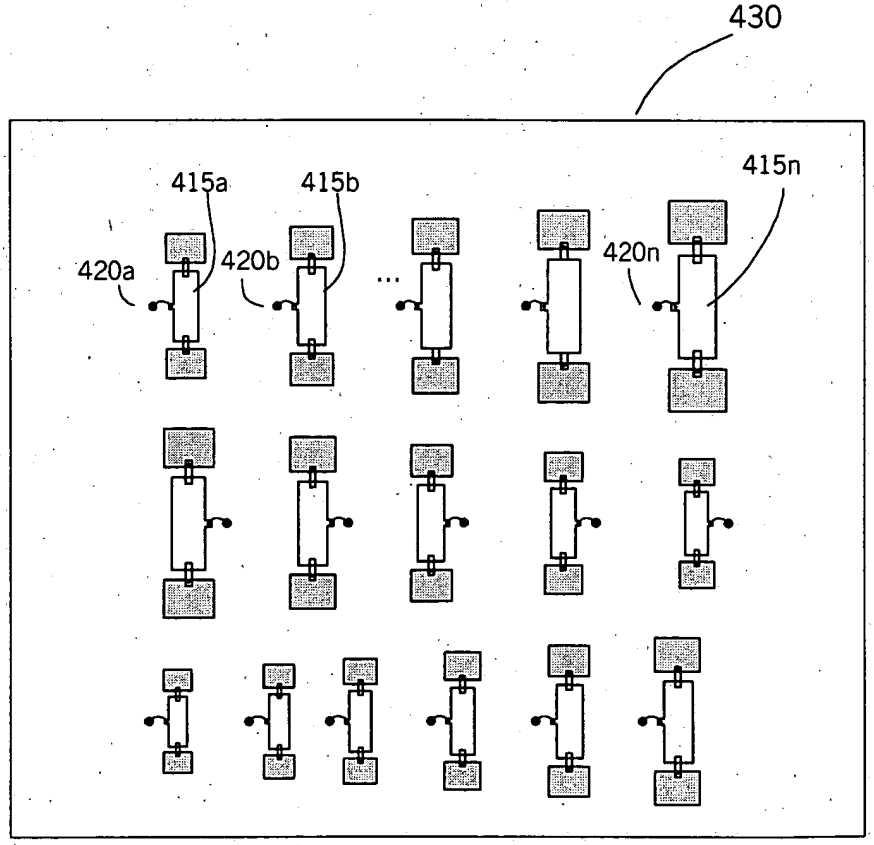


FIGURE 12a

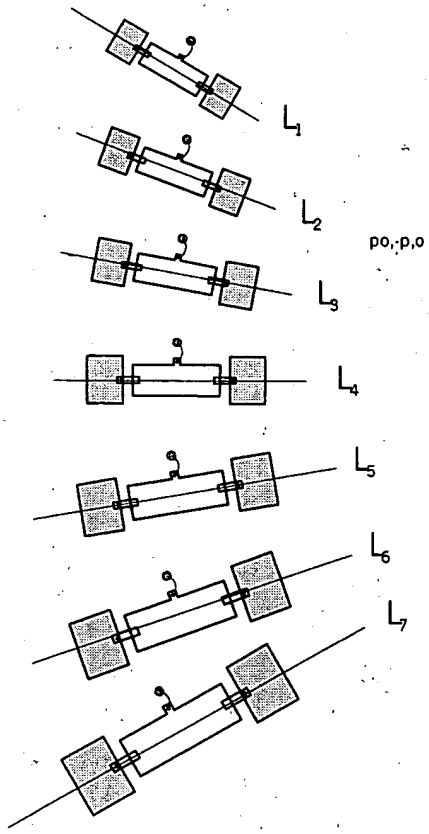


FIGURE 12b

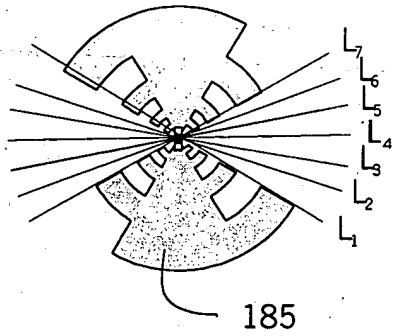


FIGURE 12c

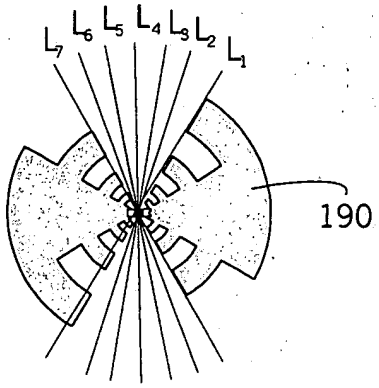


FIGURE 13

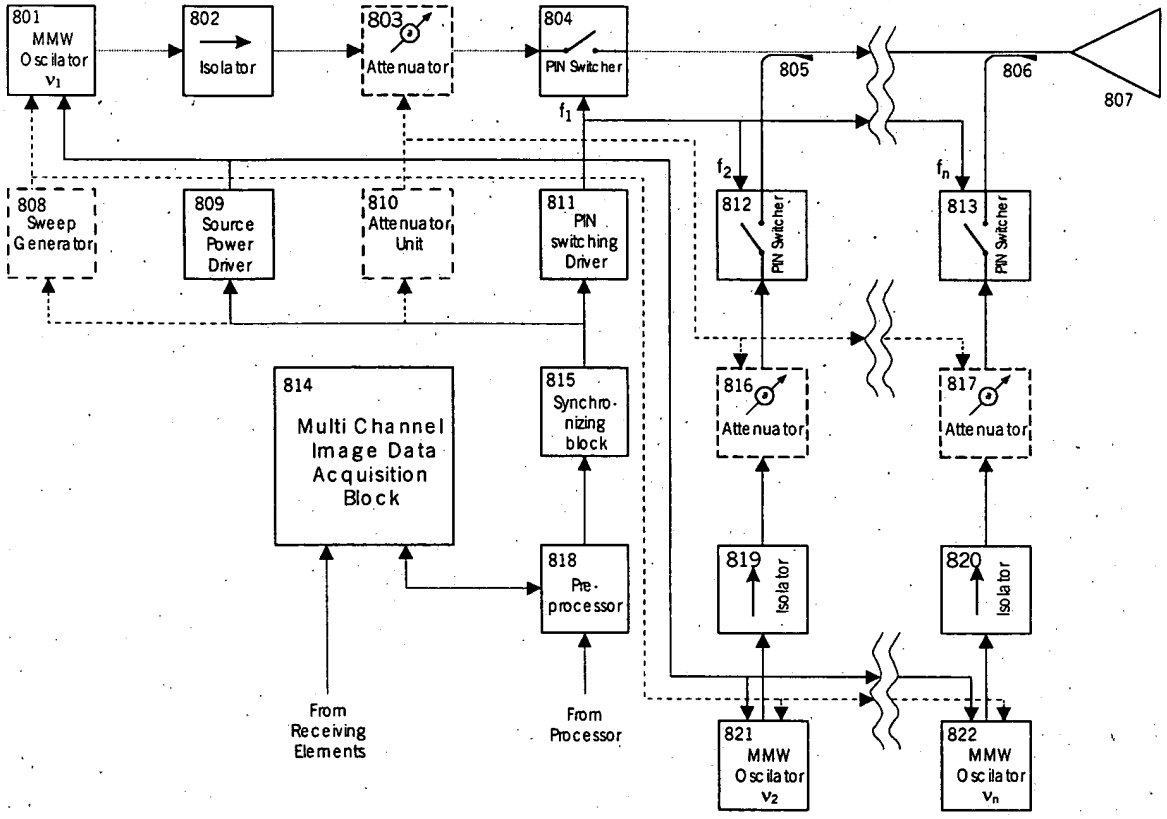

801
MMW Oscilator
ν_1
802
Isolator
803
Attenuator
804
PIN Switcher
805
806
807
f_1
f_2
f_n
808
Sweep Generator
809
Source Power Driver
810
Attenuator Unit
811
PIN switching Driver
812
PIN Switcher
813
PIN Switcher
814
Multi Channel Image Data Acquisition Block
815
Synchro-nizing block
816
Attenuator
817
Attenuator
818
Pre-processor
819
Isolator
820
Isolator
From Receiving Elements
From Processor
821
MMW Oscilator
ν_2
822
MMW Oscilator
ν_n

FIGURE 14a

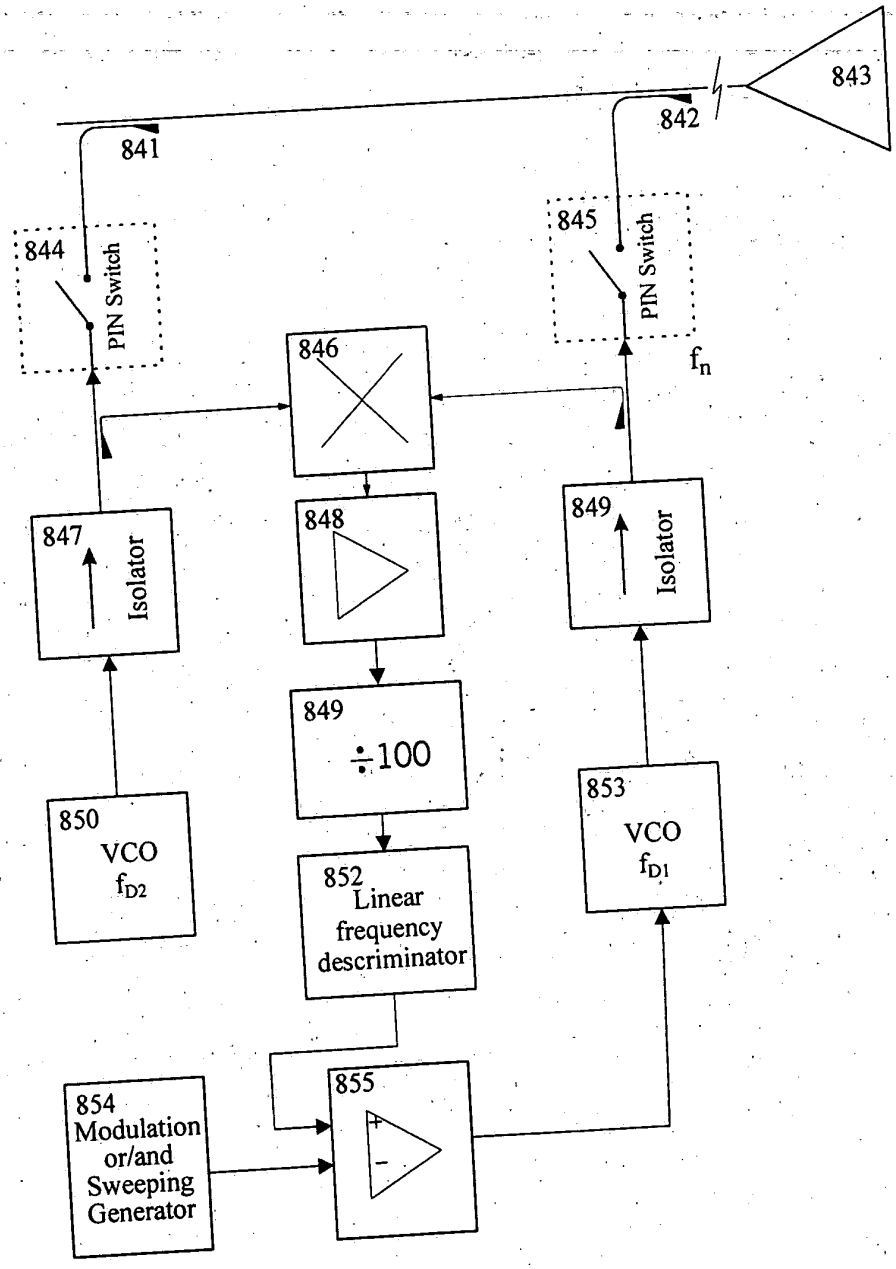

843
842
841
845
PIN Switch
844
PIN Switch
846
f_n
847
Isolator
848
849
Isolator
849
÷100
850
VCO
f_{D2}
852
Linear
frequency
descriminator
853
VCO
f_{D1}
854
Modulation
or/and
Sweeping
Generator
855
+
-

FIGURE 14b

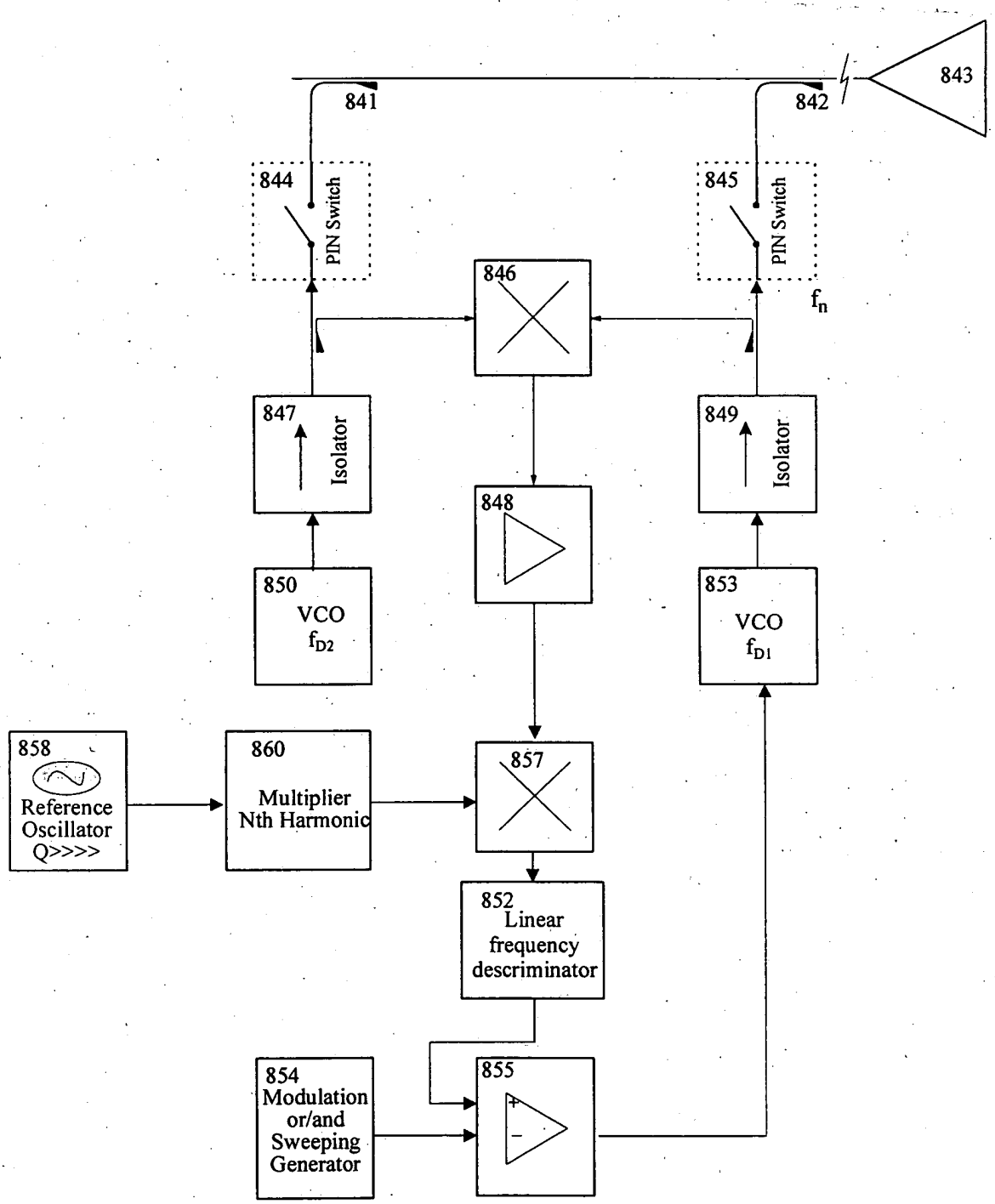

843
841
842
844
PIN Switch
845
PIN Switch
846
f_n
847
Isolator
849
Isolator
848
850
VCO
f_{D2}
853
VCO
f_{D1}
858
Reference
Oscillator
Q>>>>
860
Multiplier
Nth Harmonic
857
852
Linear
frequency
descriminator
854
Modulation
or/and
Sweeping
Generator
855

FIGURE 15

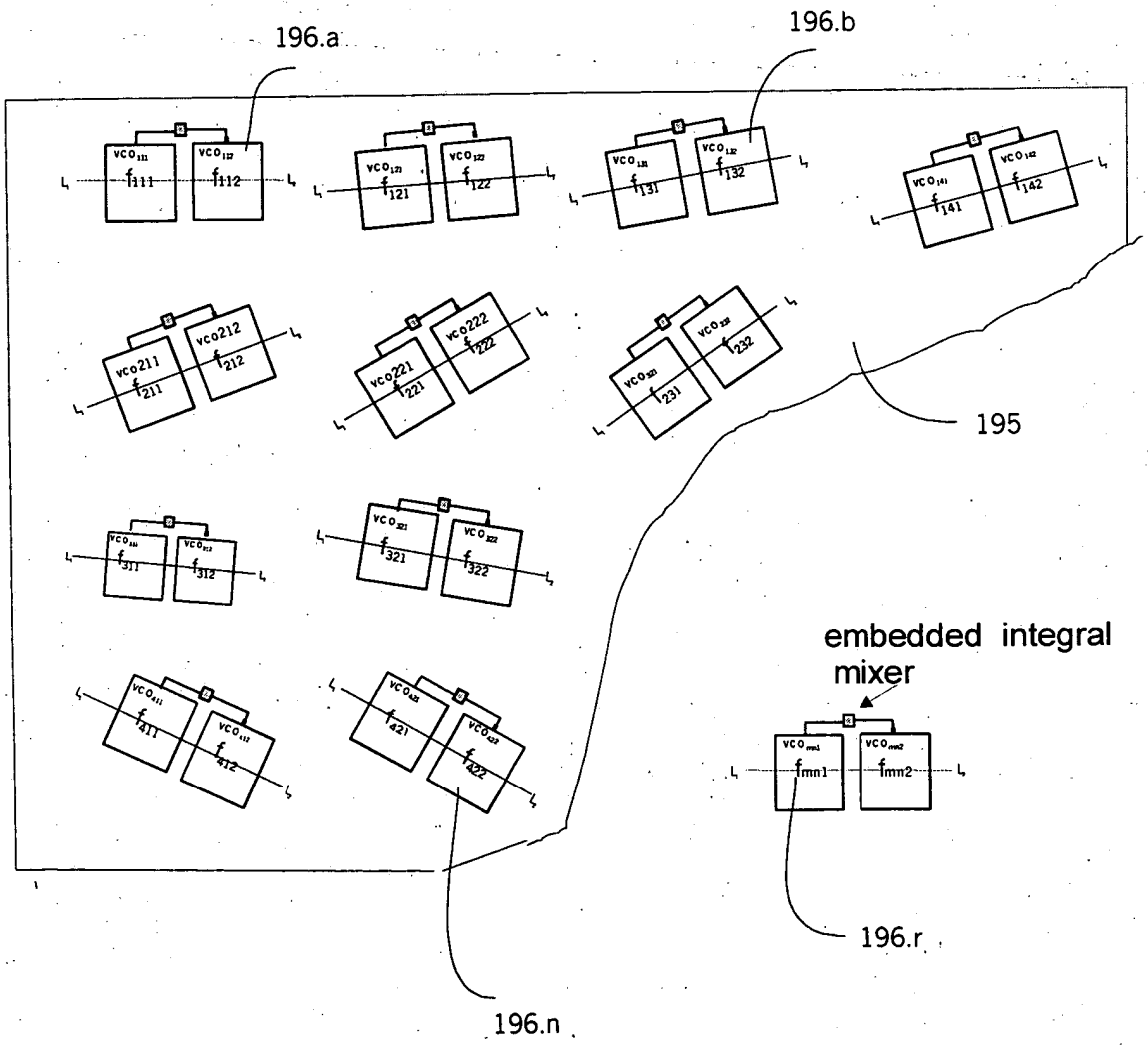


FIGURE 16

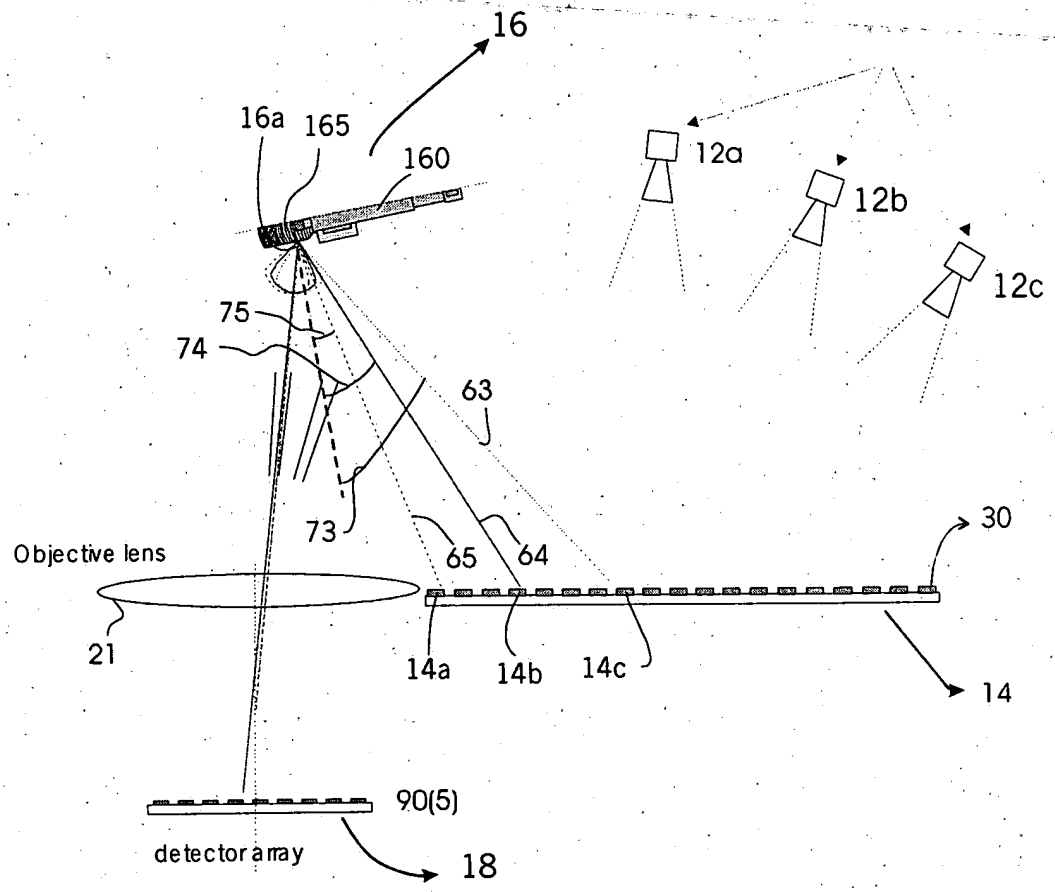

16
16a
165
160
12a
12b
12c
75
74
63
73
65
64
30
Objective lens
21
14a
14b
14c
14
90(5)
detector array
18

FIGURE 17a

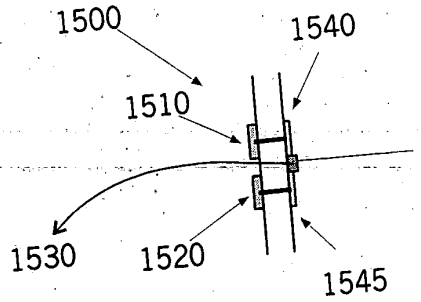


FIGURE 17b

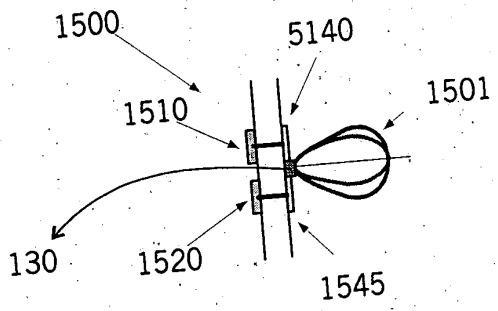


FIGURE 17c

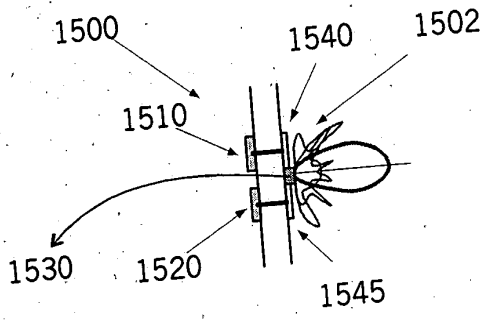


FIGURE 18a

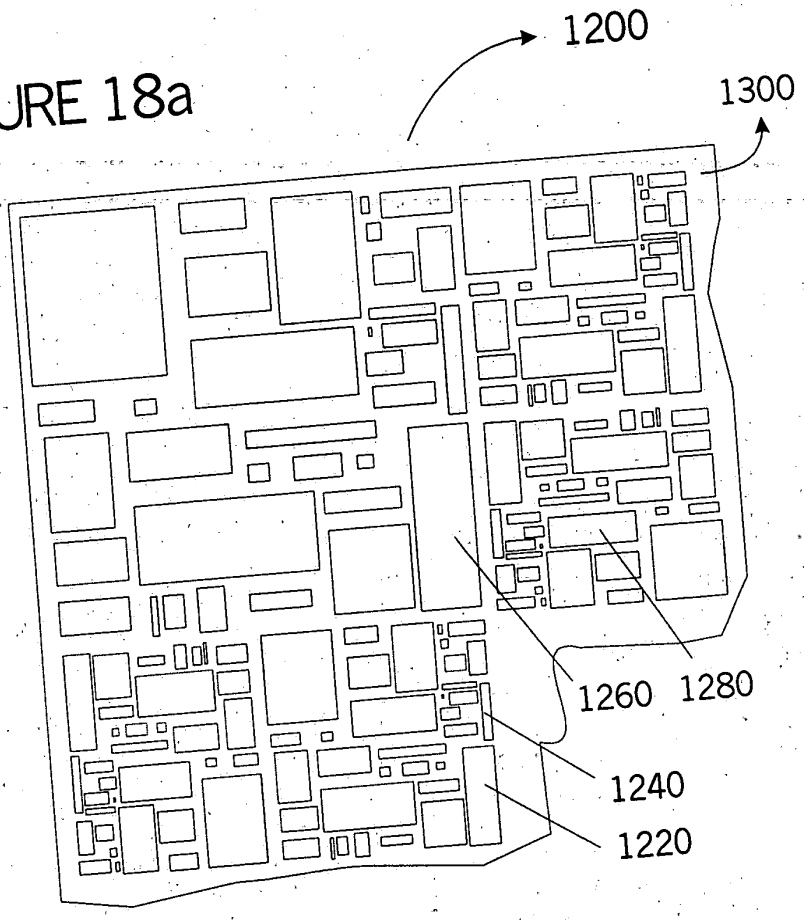


FIGURE 18b

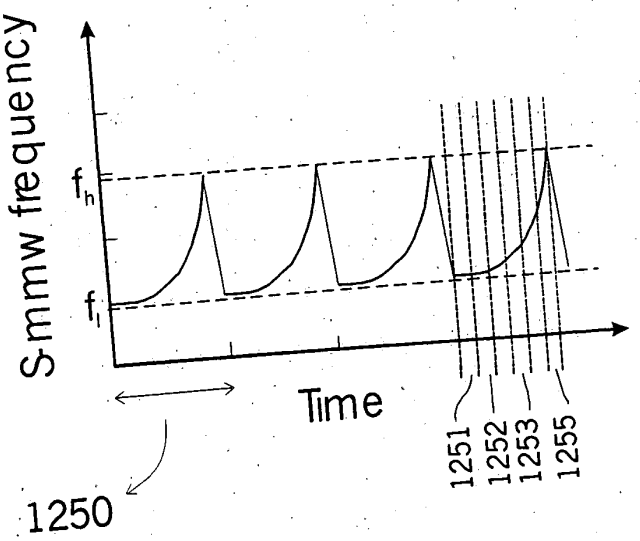


FIGURE 19a

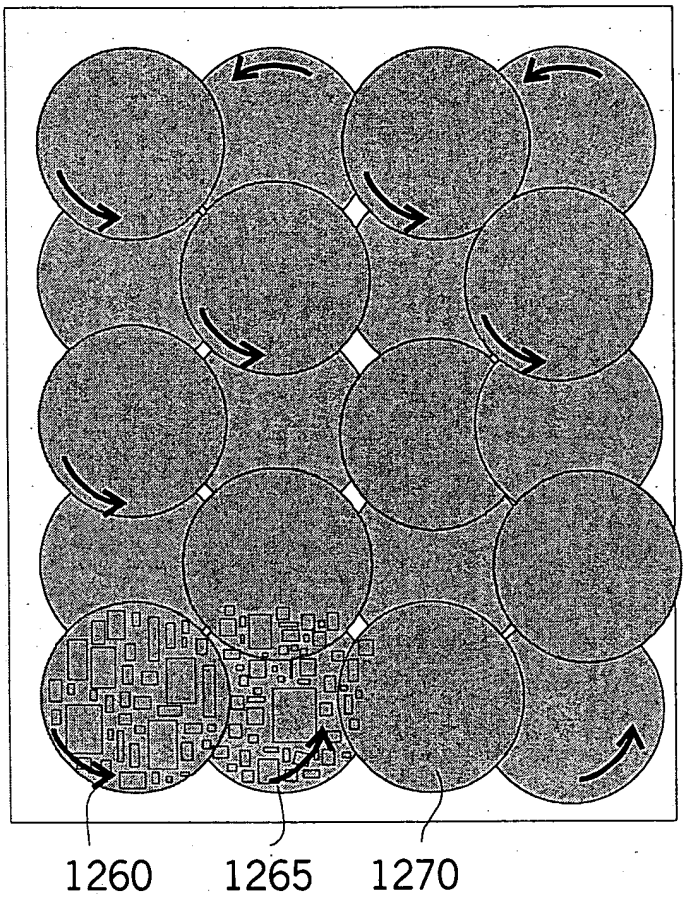


FIGURE 19b

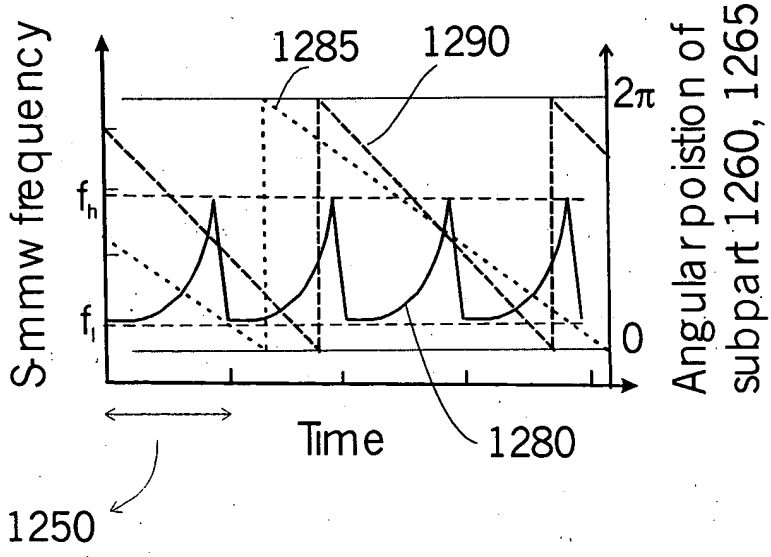


FIGURE 20a

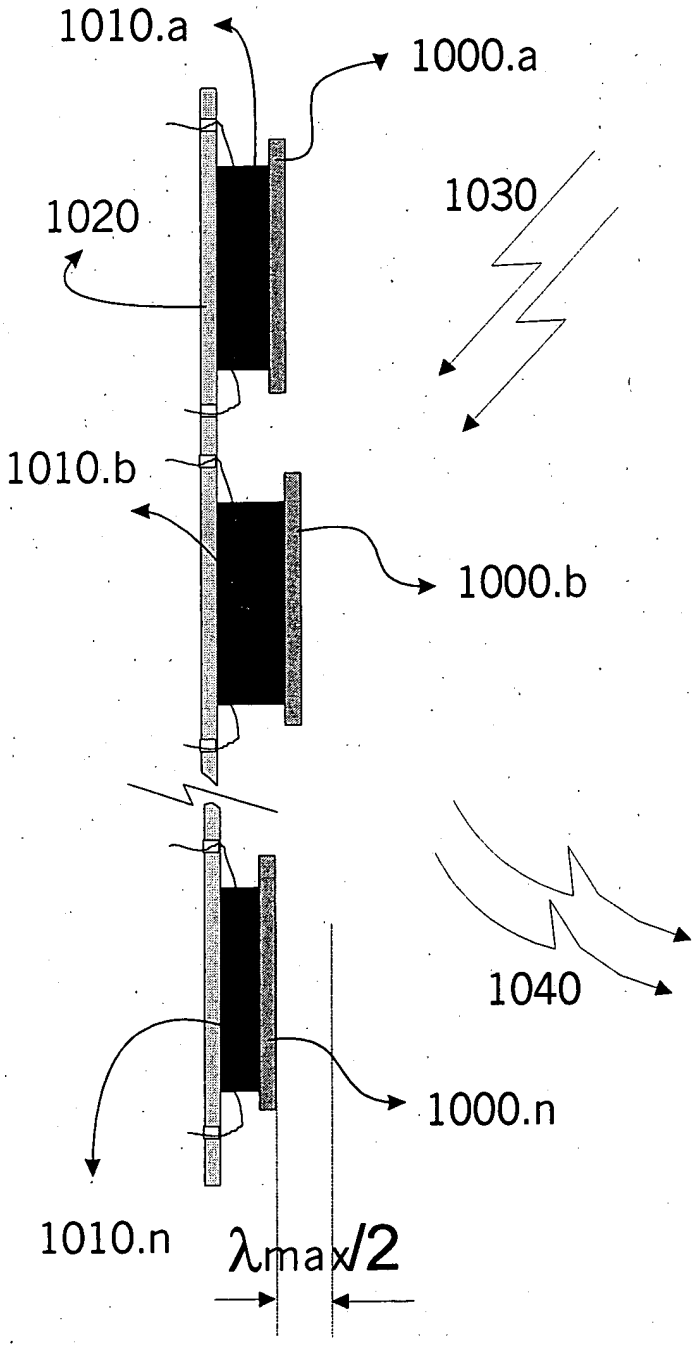


FIGURE 20b

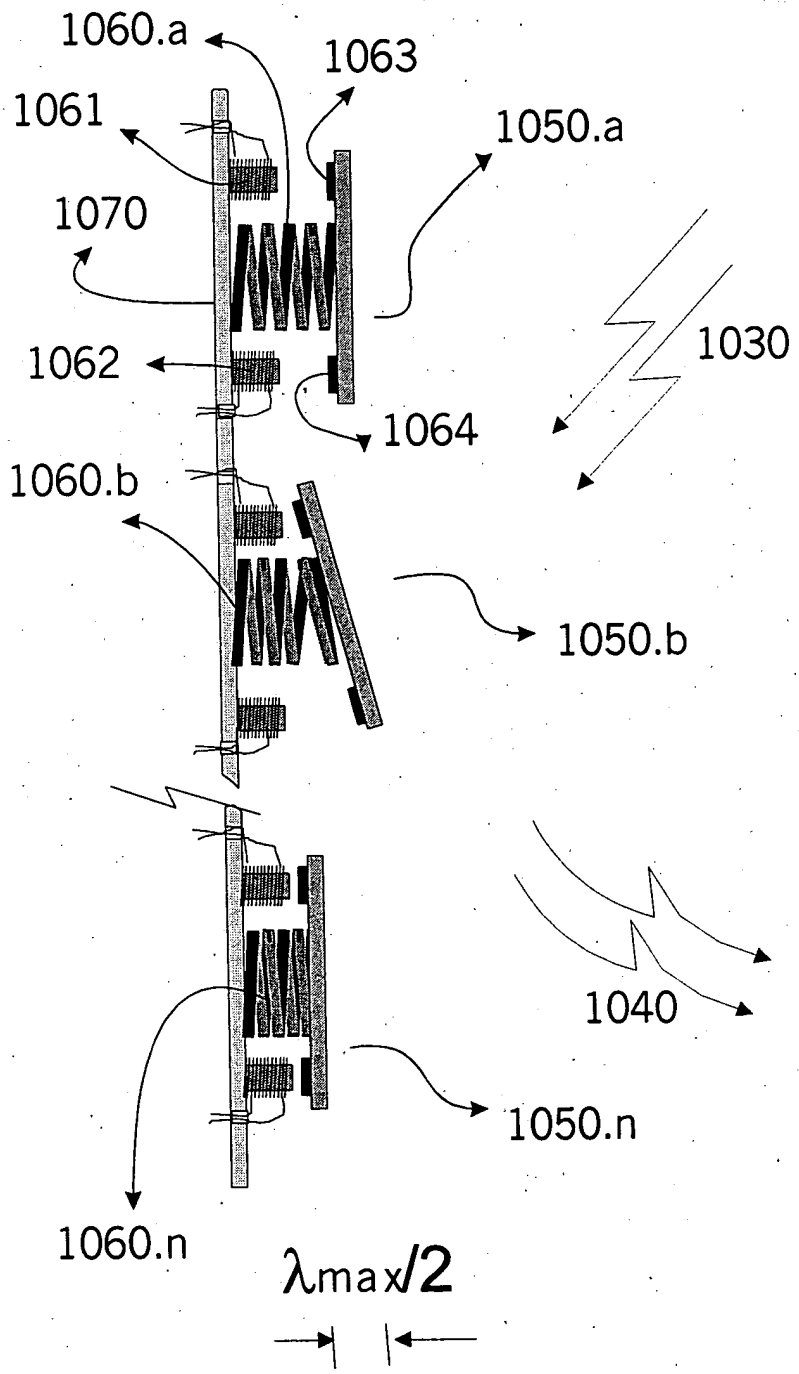

1060.a
1063
1061
1050.a
1070
1030
1062
1064
1060.b
1050.b
1040
1050.n
1060.n
λmax/2

FIGURE 21

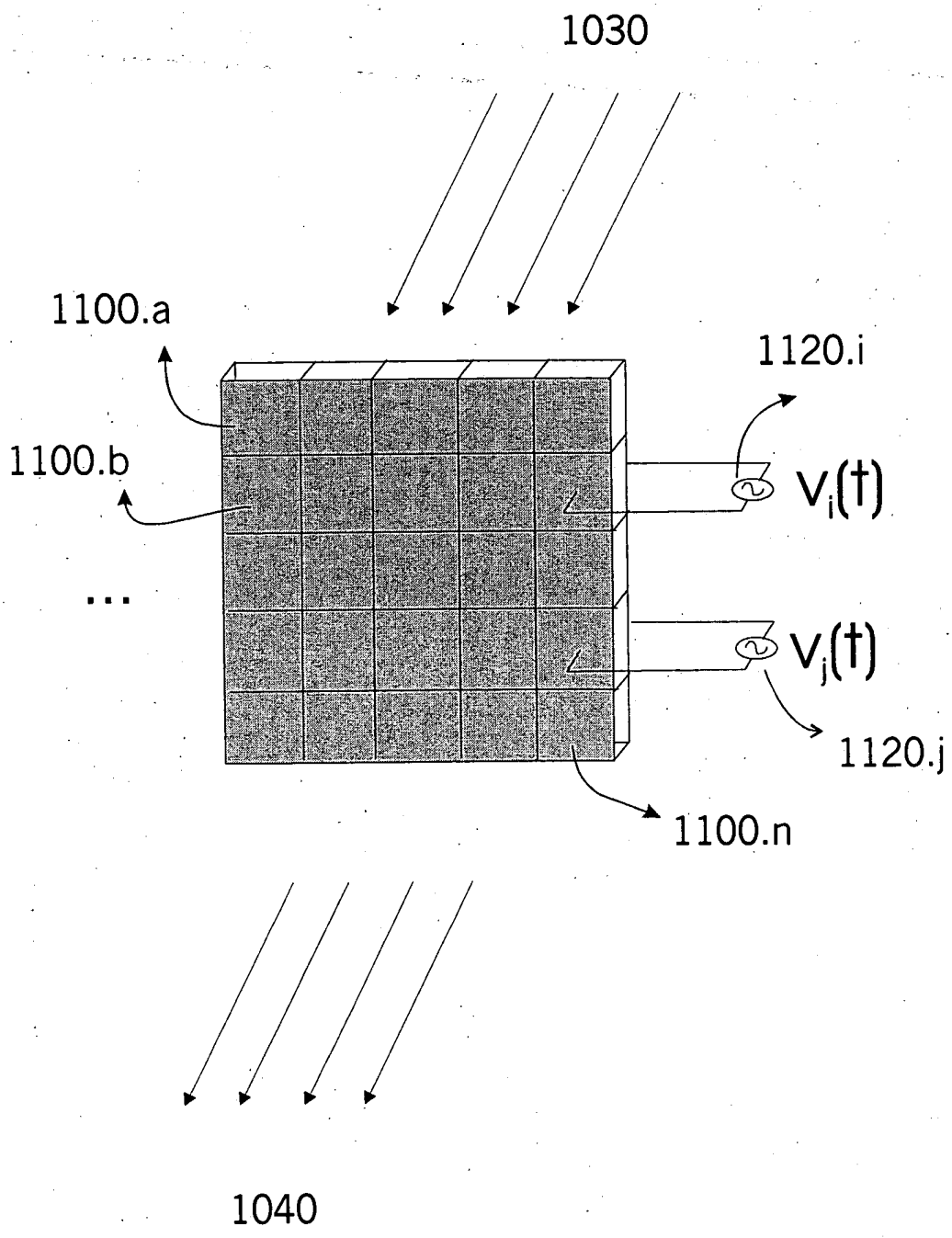


FIGURE 22

PRIOR ART

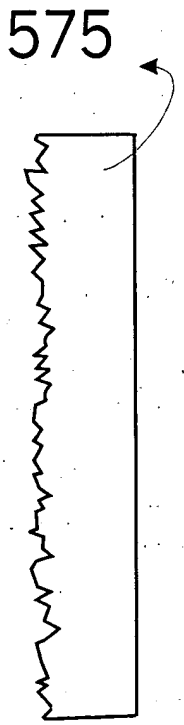


FIGURE 23a

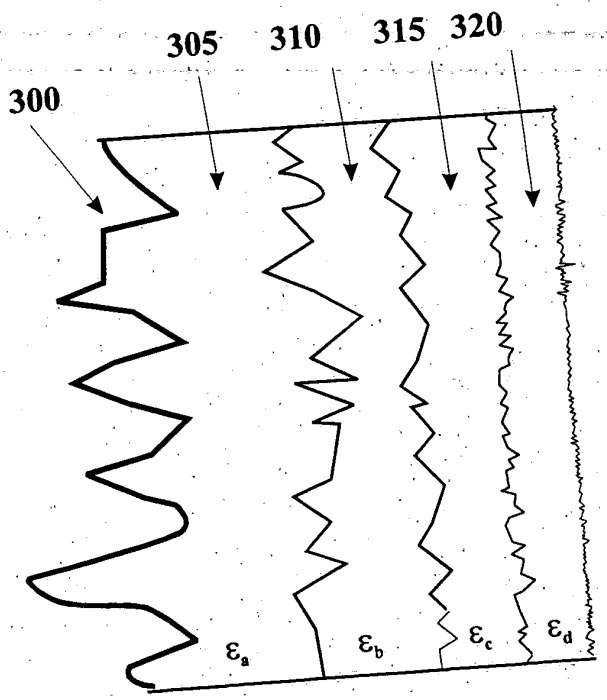


FIGURE 23b

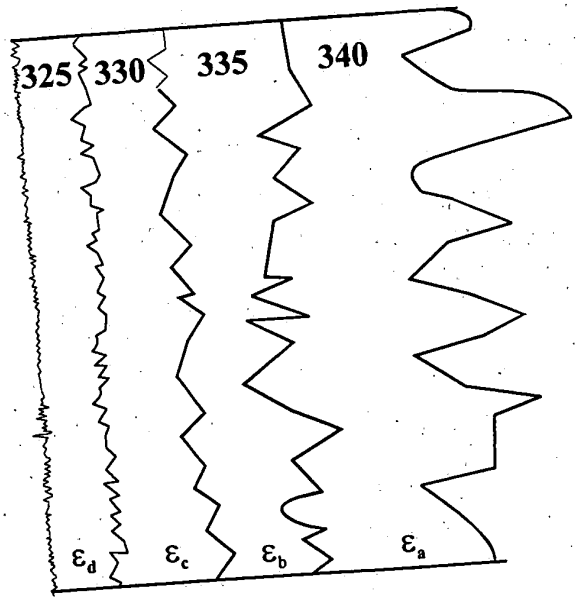


FIGURE 24

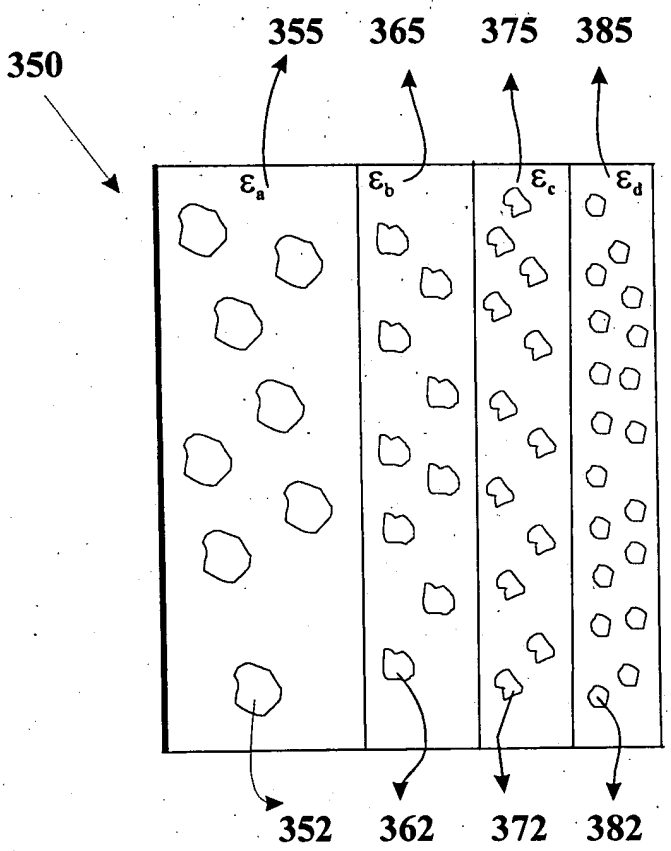

350
355
365
375
385
ε_a
ε_b
ε_c
ε_d
352
362
372
382

FIGURE 25a

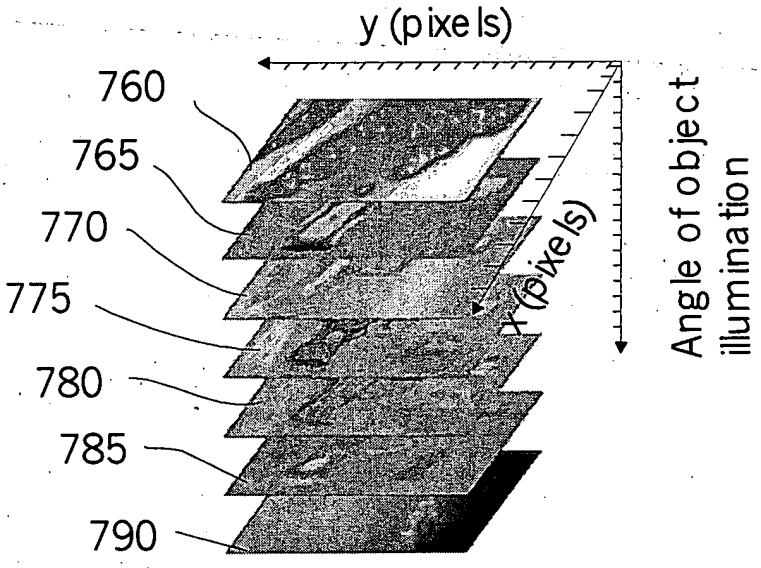


FIGURE 25b

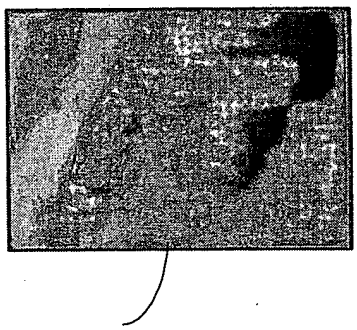


FIGURE 26

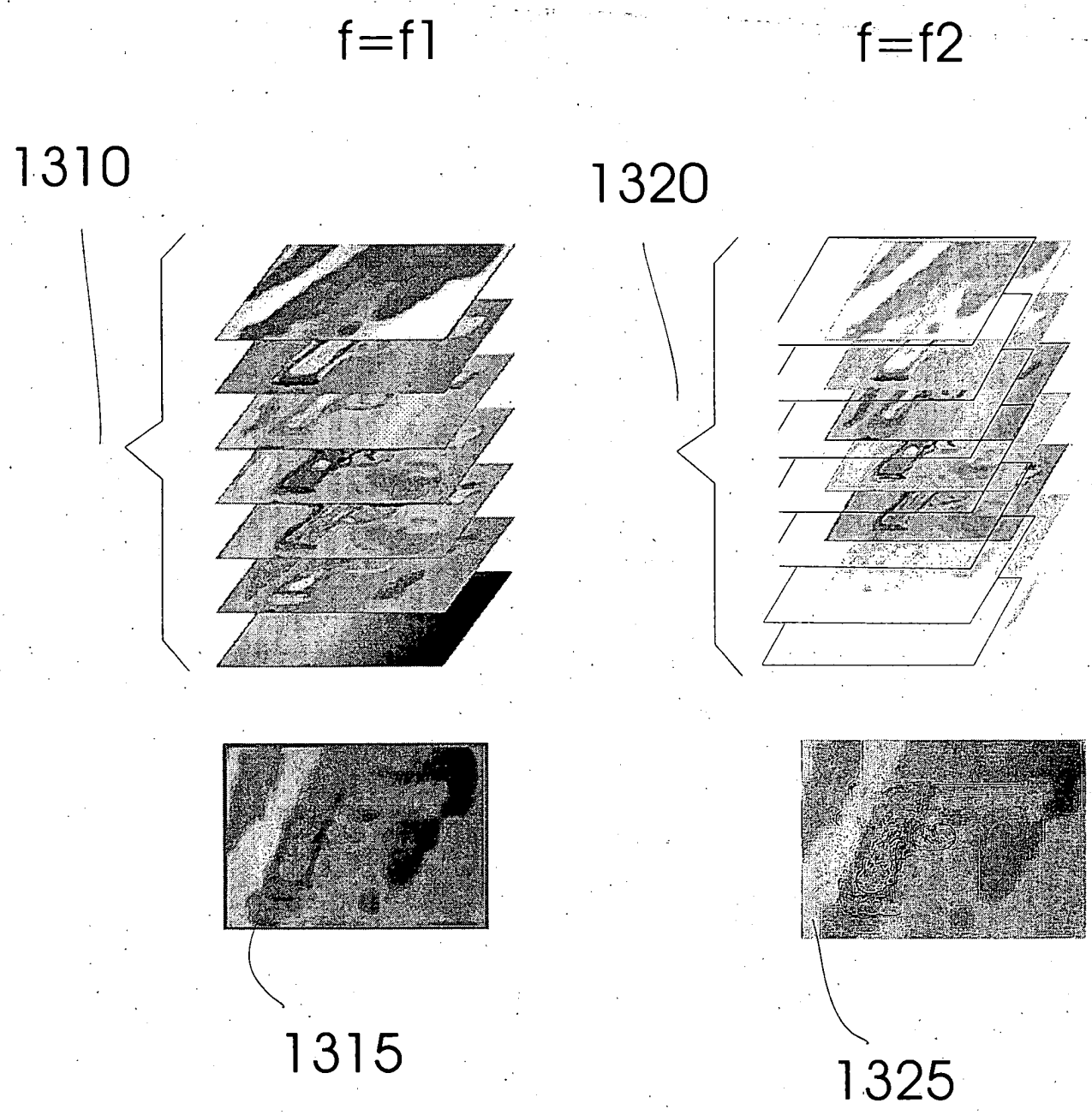


FIG URE 27.a

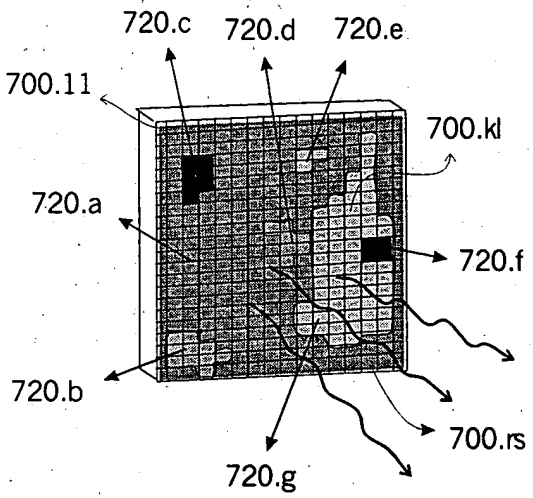


FIG URE 27.b

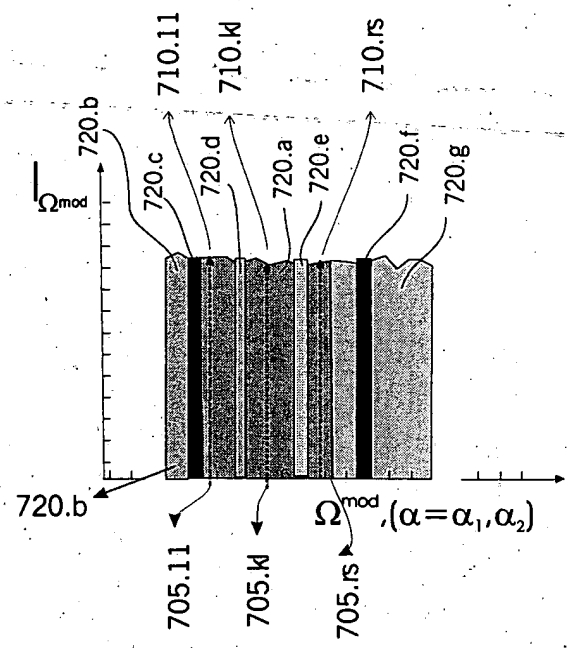


FIG URE 27.c
for pixel (x_{m0},y_{n0})

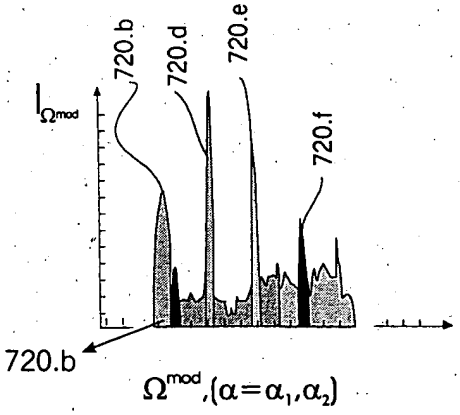


FIG URE 27.d
for whole array of pixels

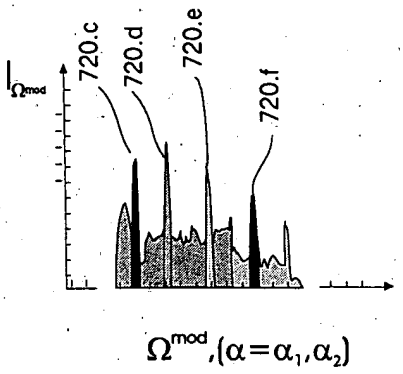


FIGURE 28a

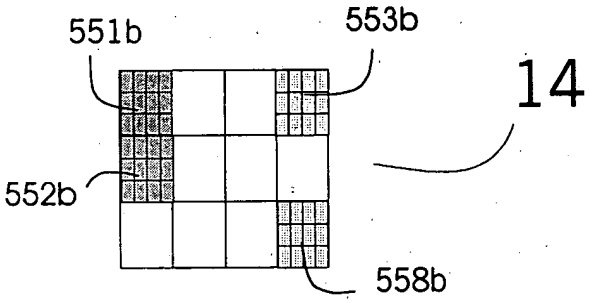


FIGURE 28b

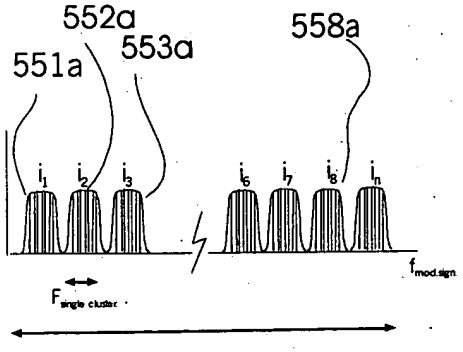


Figure 29

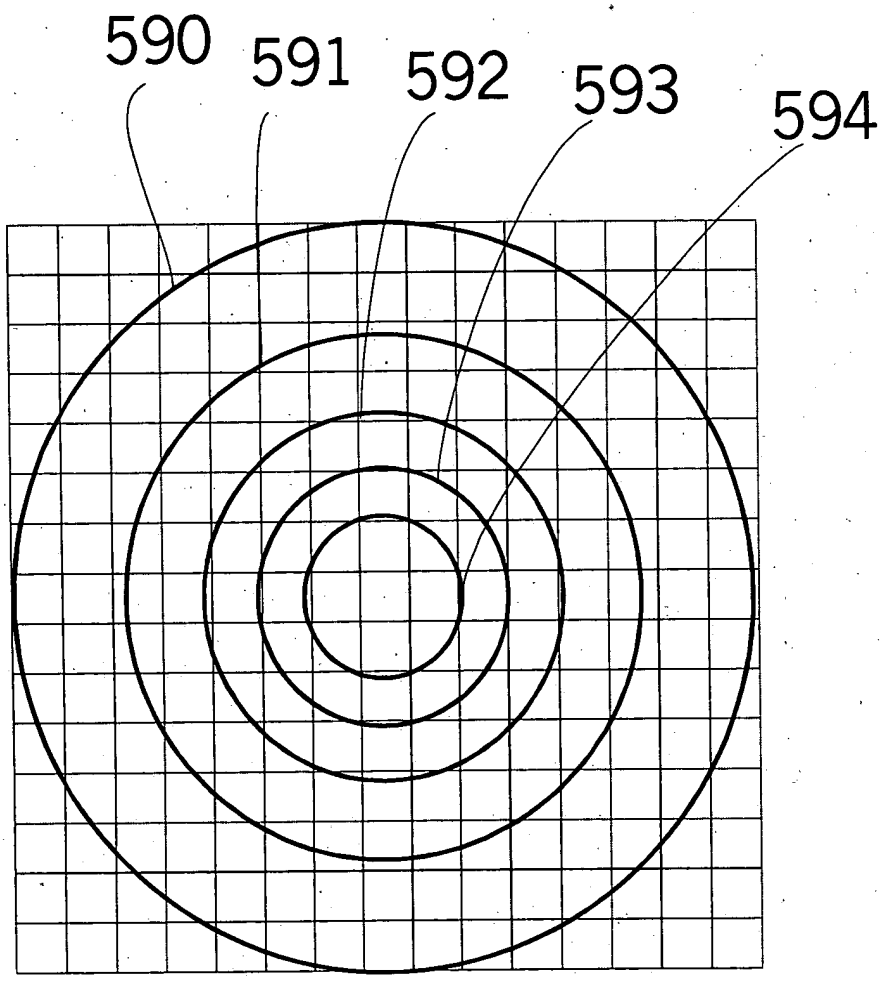


Figure 30

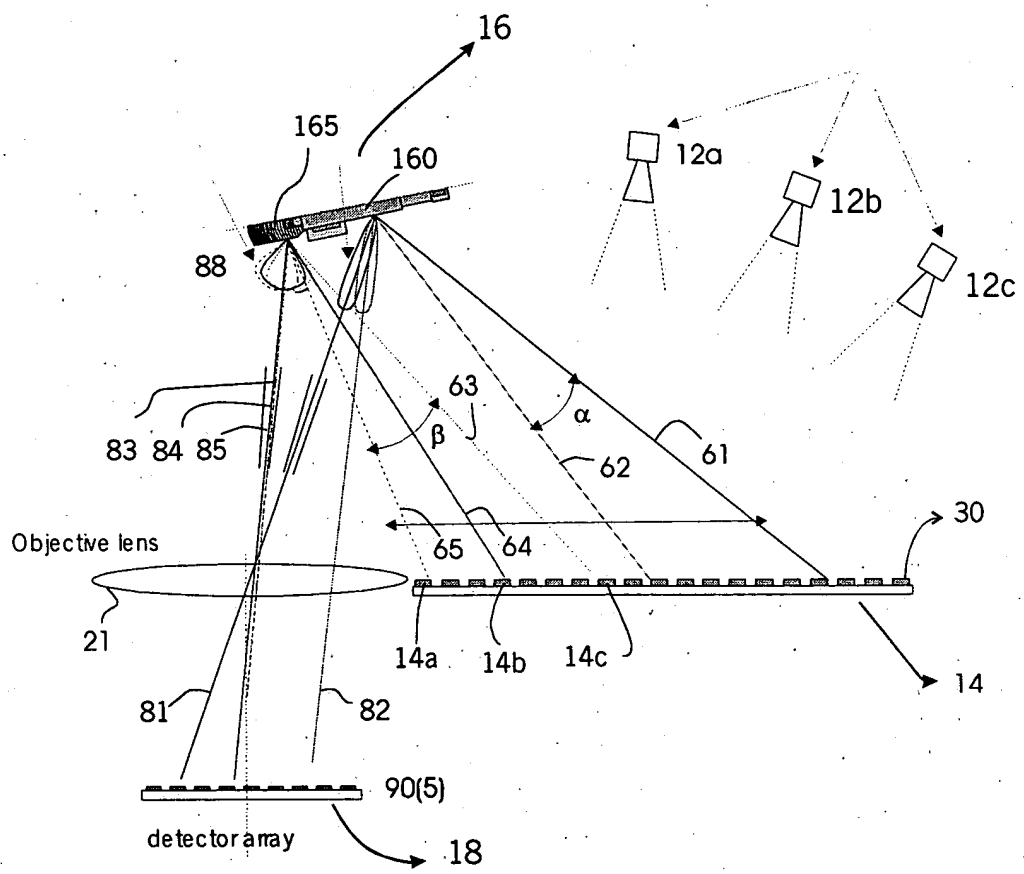

16
165
160
12a
12b
12c
88
63
α
β
83 84 85
62
61
30
Objective lens
65
64
21
14a
14b
14c
14
81
82
90(5)
detector array
18

FIGURE 31

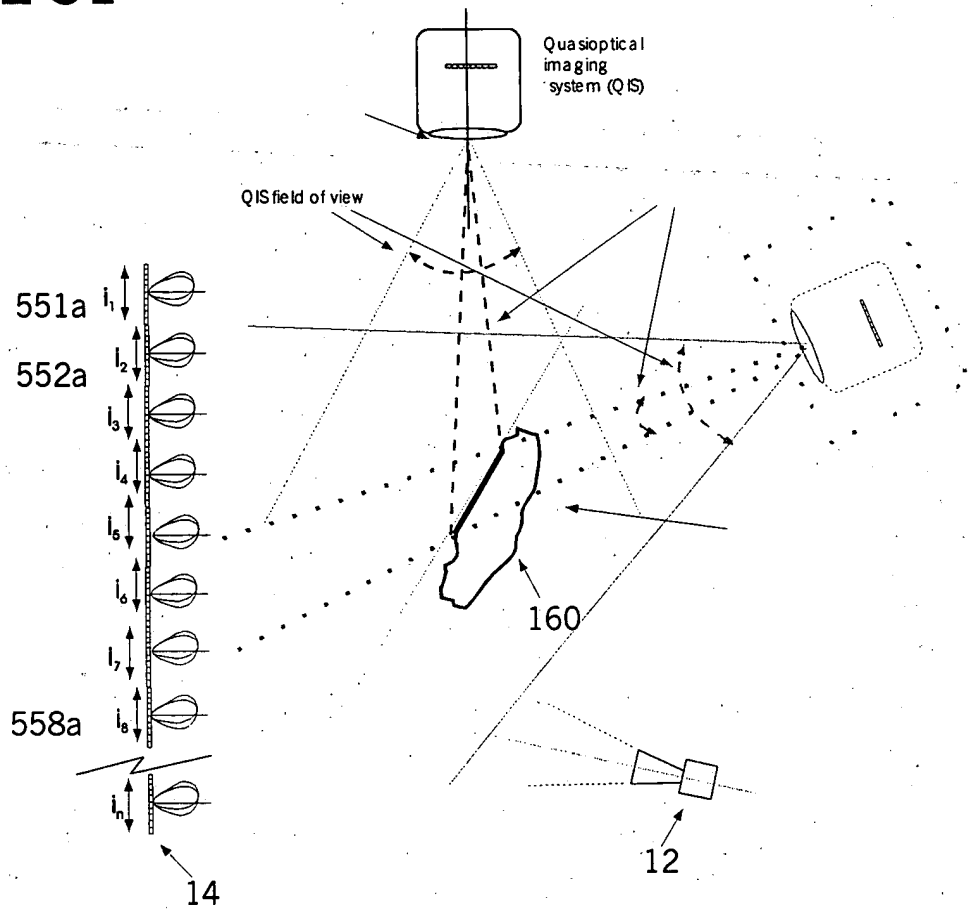

Quasioptical imaging system (QIS)
QIS field of view
551a
552a
558a
i_1
i_2
i_3
i_4
i_5
i_6
i_7
i_8
i_n
160
12
14

FIGURE 32

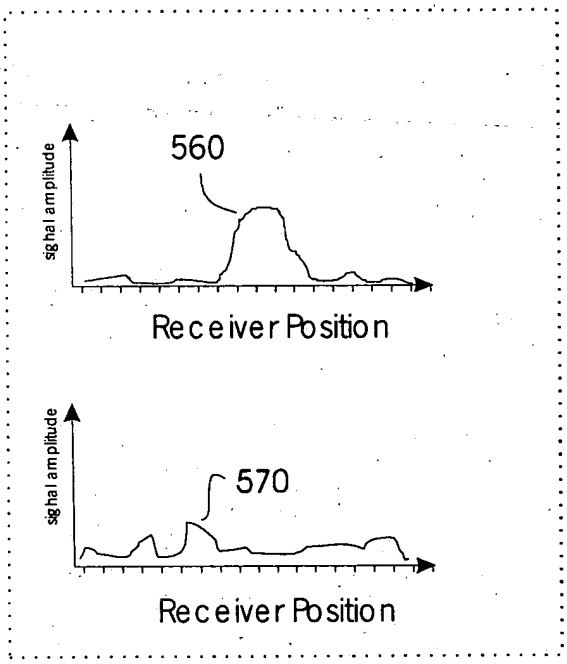

560
signal amplitude
Receiver Position
570
signal amplitude
Receiver Position

FIGURE 33

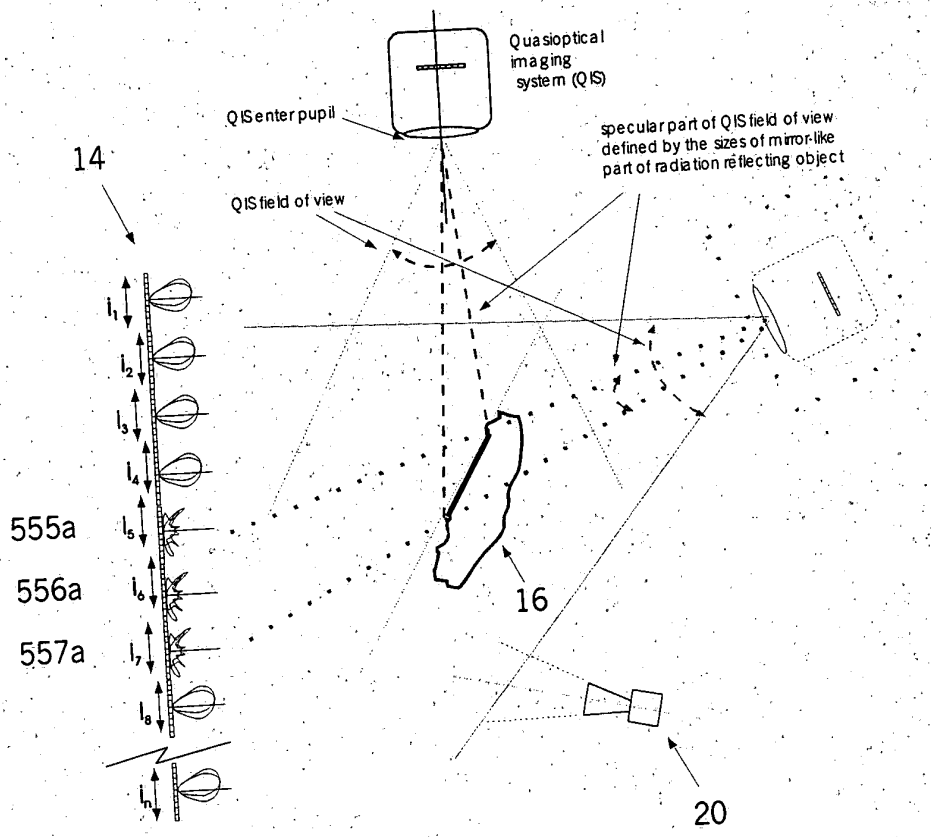

Quasioptical imaging system (QIS)
QIS enter pupil
specular part of QIS field of view defined by the sizes of mirror-like part of radiation reflecting object
14
QIS field of view
555a
556a
557a
16
20

FIGURE 34

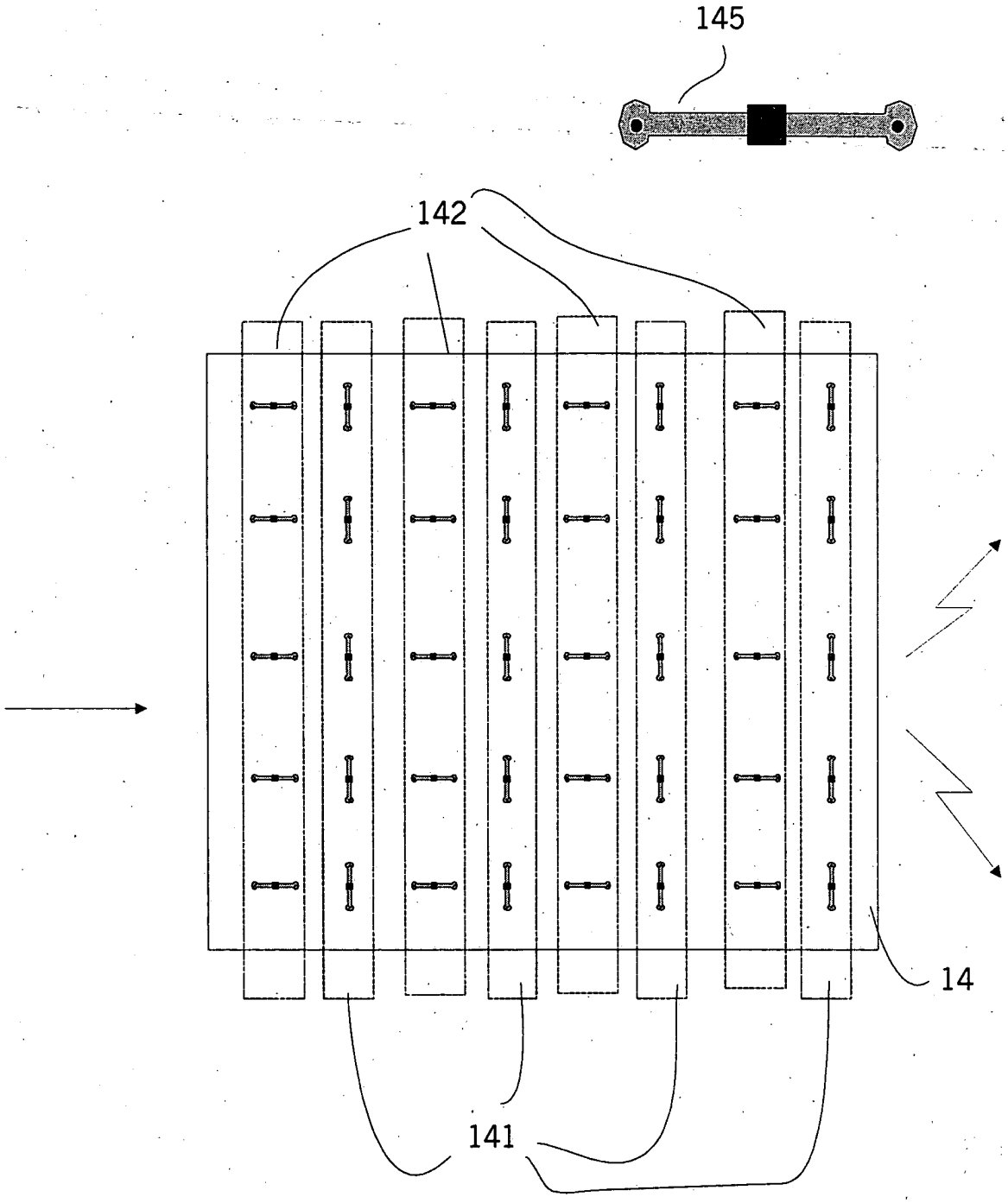


FIGURE 35

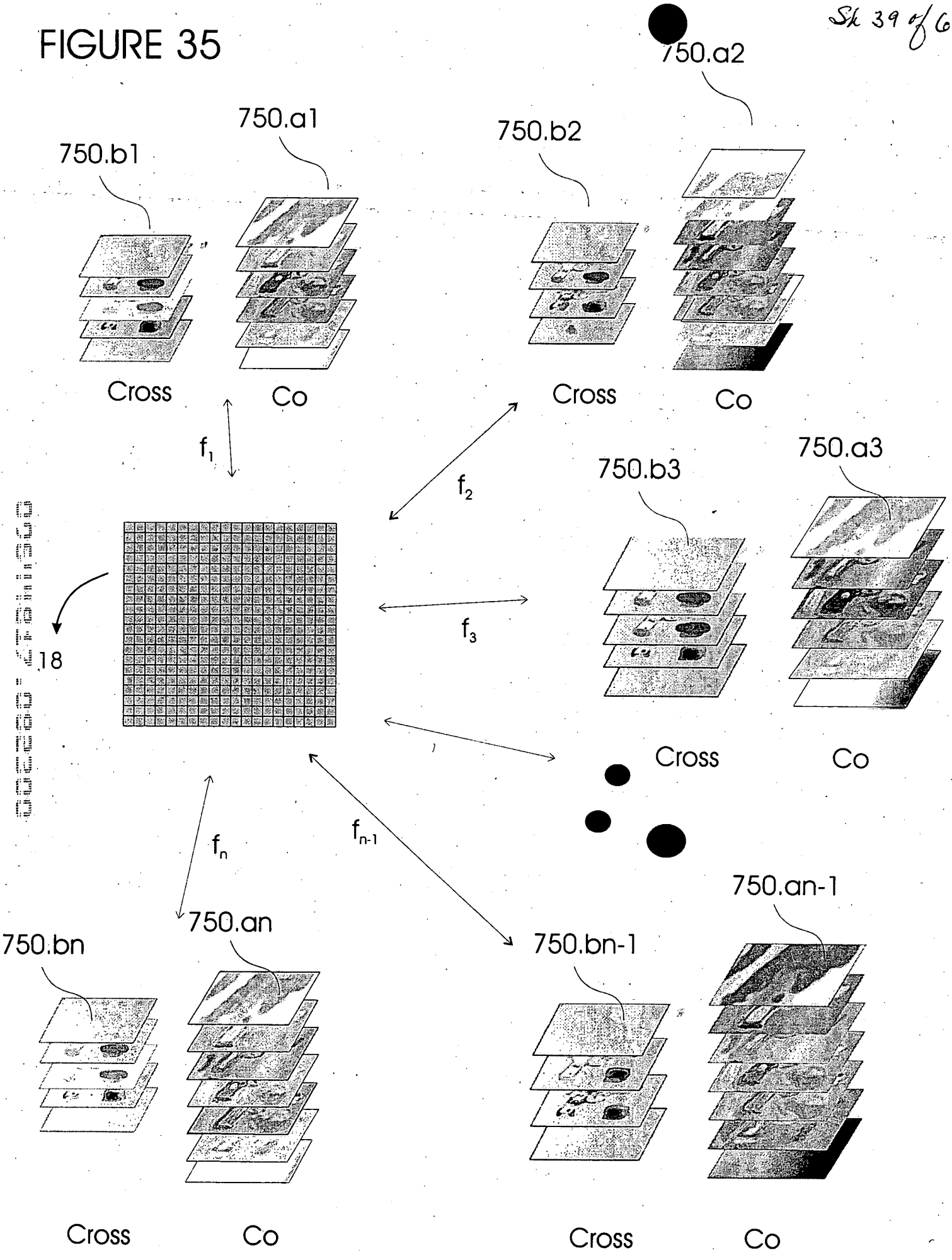

750.a2
750.a1
750.b2
750.b1
Cross
Co
Cross
Co
f_1
f_2
750.a3
750.b3
18
f_3
Cross
Co
f_n
f_{n-1}
750.an-1
750.an
750.bn
750.bn-1
Cross
Co
Cross
Co

FIGURE 36a

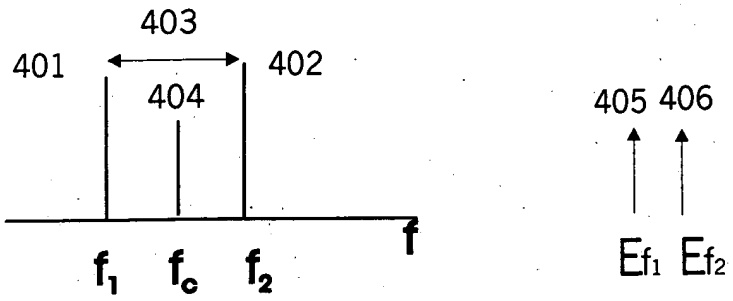


FIGURE 36b

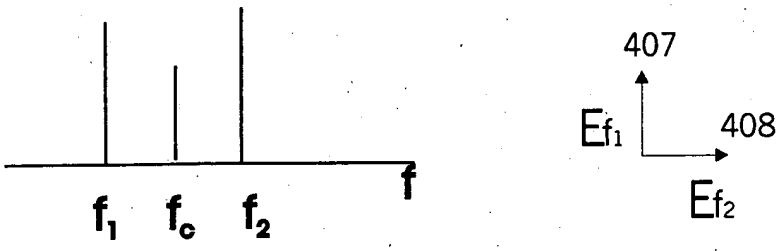


FIGURE 37a

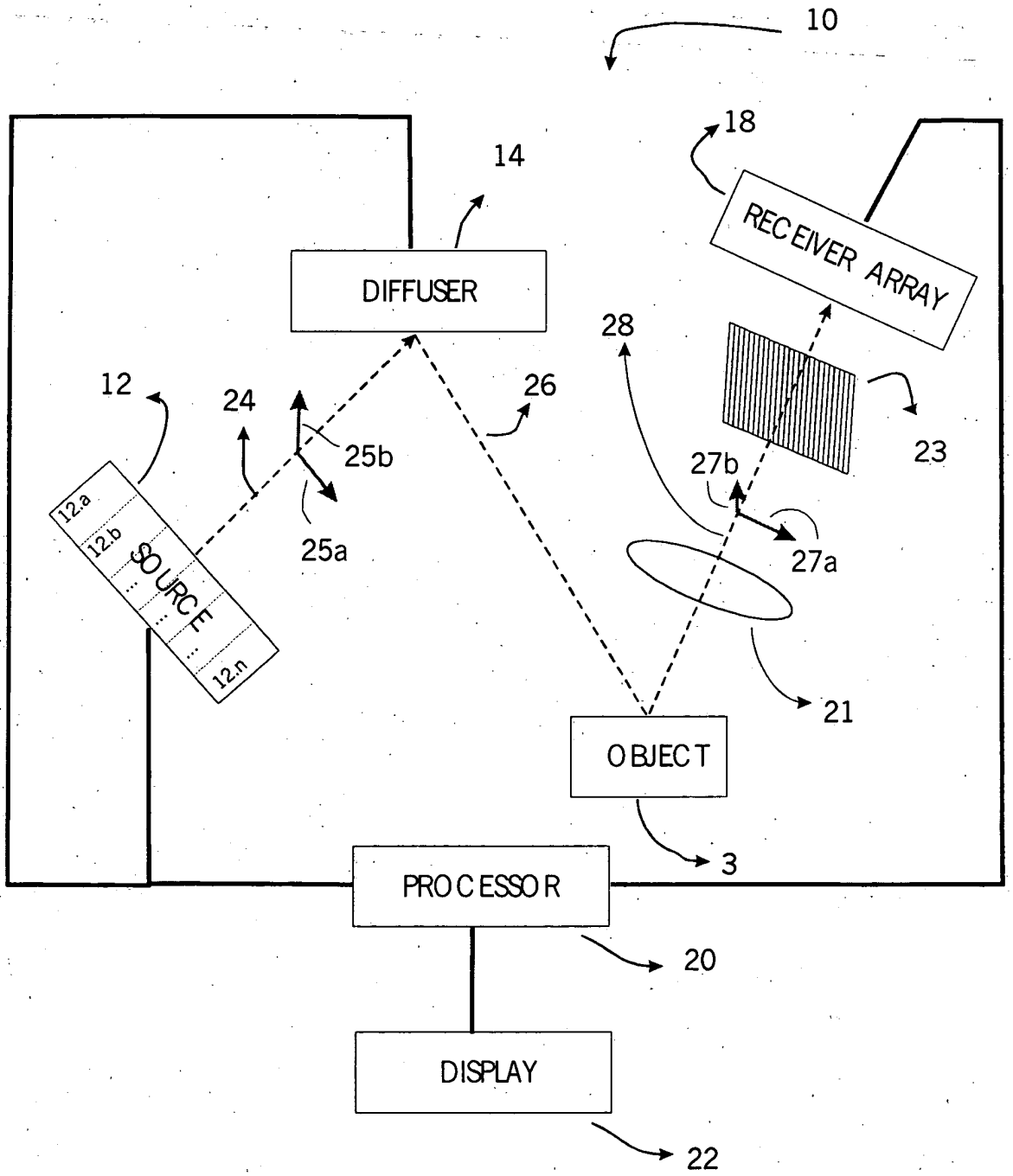

10
18
14
RECEIVER ARRAY
DIFFUSER
28
12
24
26
25b
23
27b
25a
27a
12a
12b
SOURCE
12n
21
OBJECT
3
PROCESSOR
20
DISPLAY
22

FIGURE 37b

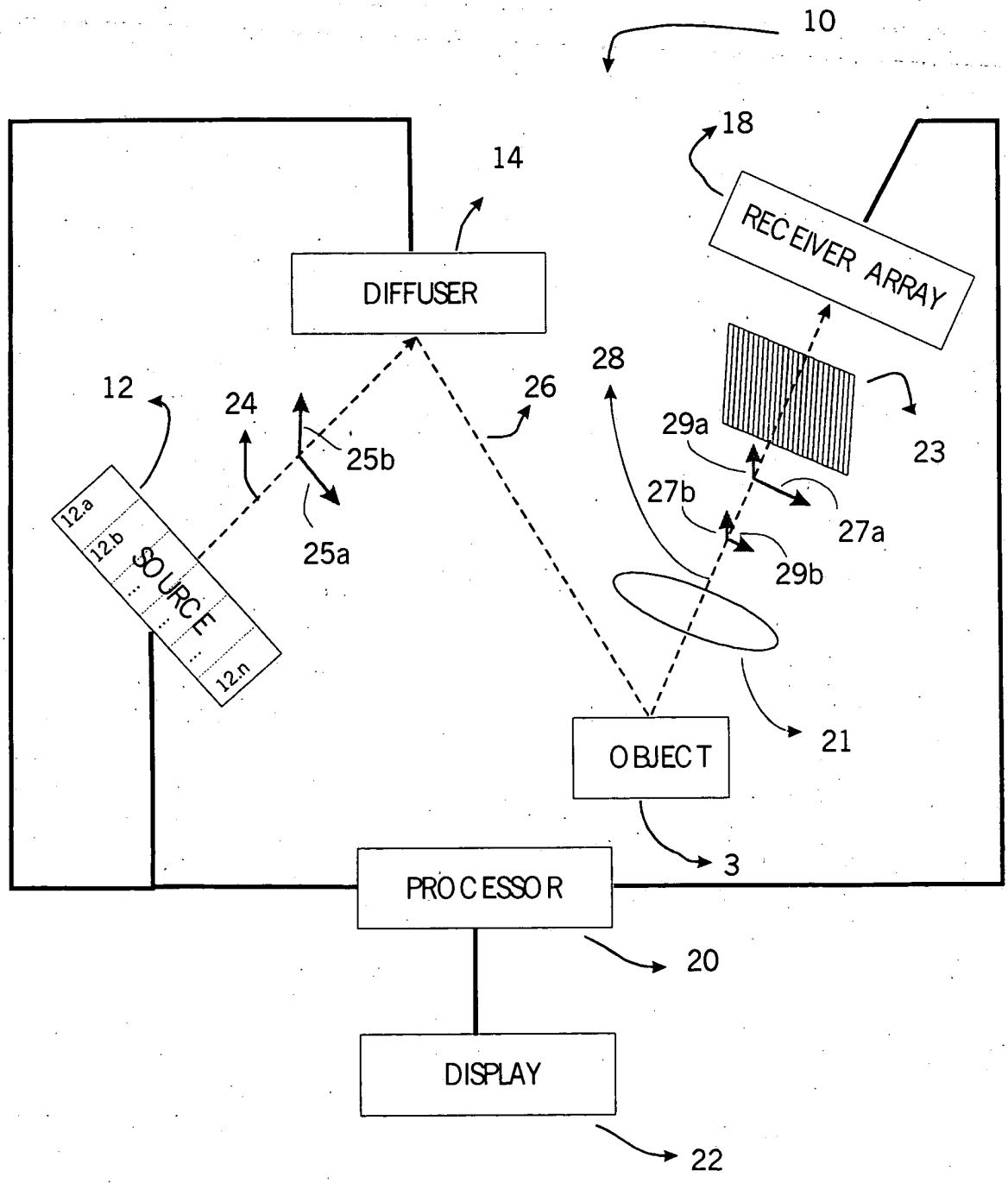

10
14
18
DIFFUSER
RECEIVER ARRAY
12
24
26
28
29a
23
25b
27b
27a
25a
29b
12a
12b
SOURCE
12n
21
OBJECT
3
PROCESSOR
20
DISPLAY
22

FIGURE 38

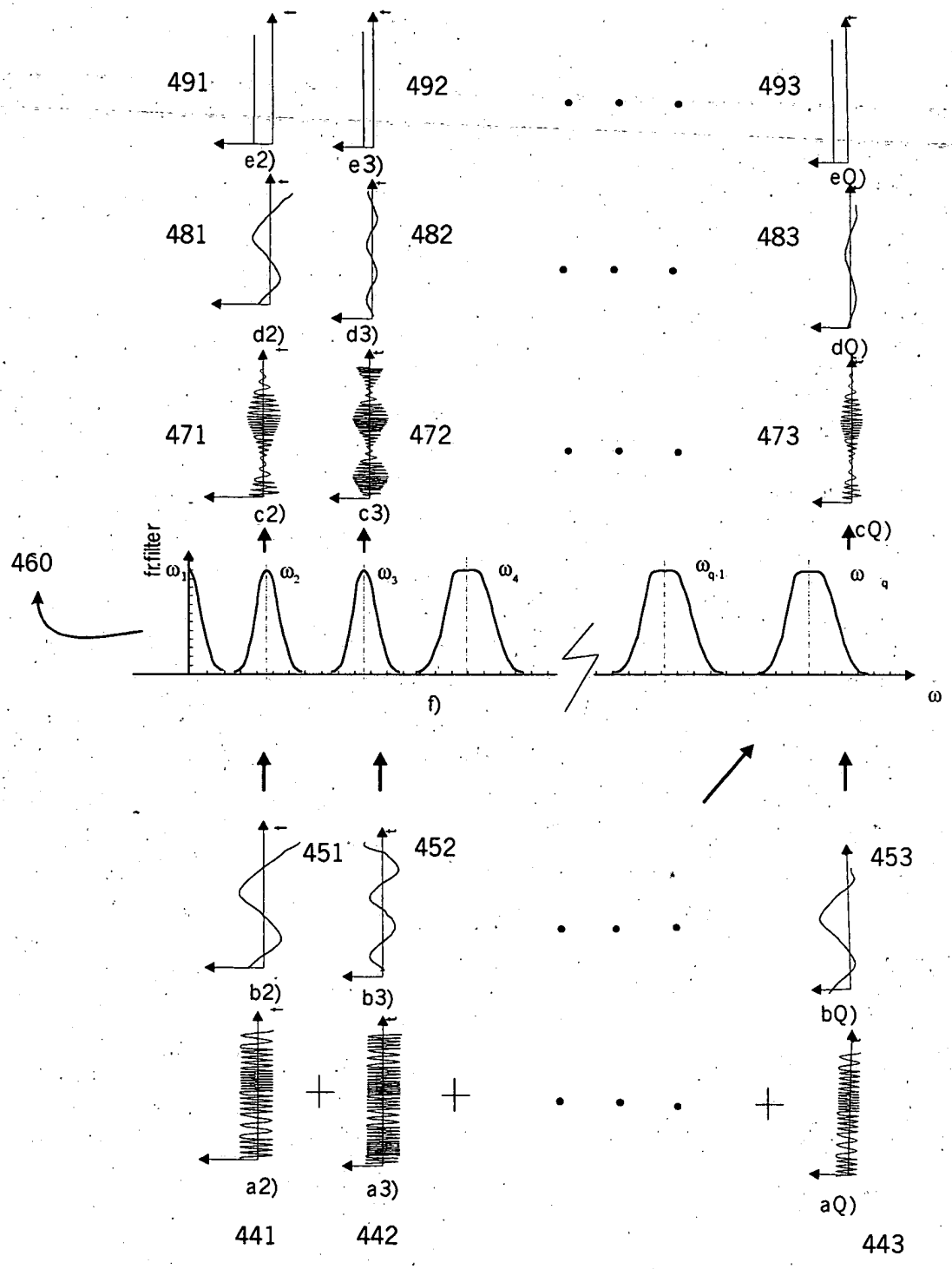

491
492
493
e2)
e3)
eQ)
481
482
483
d2)
d3)
dQ)
471
472
473
c2)
c3)
cQ)
460
fr.filter
ω1
ω2
ω3
ω4
ωq-1
ωq
f)
ω
451
452
453
b2)
b3)
bQ)
a2)
a3)
aQ)
441
442
443

FIGURE 39

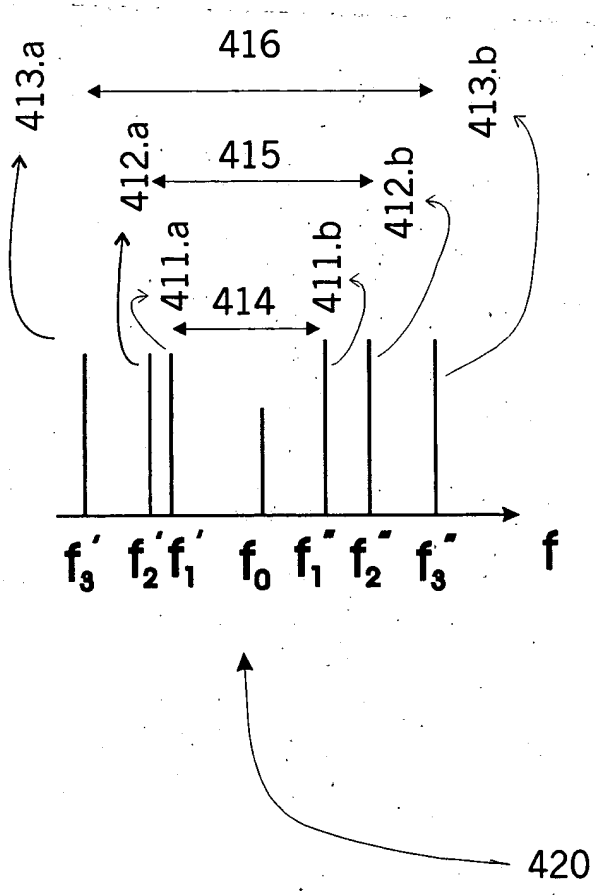
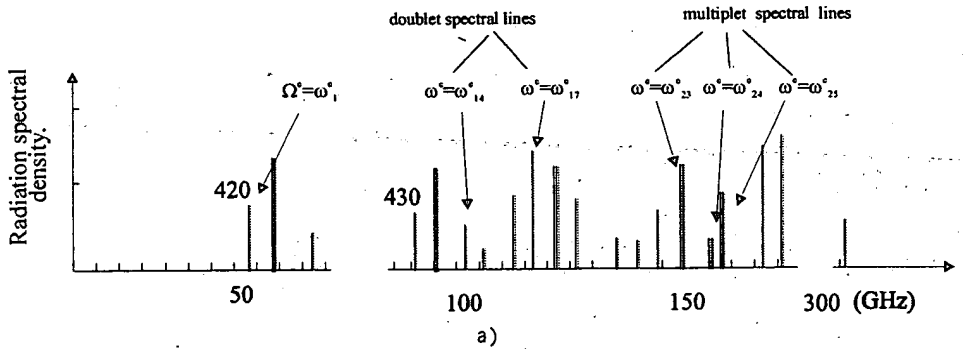

416
413.a
413.b
415
412.a
412.b
411.a
411.b
414
f3′ f2′ f1′ f0 f1″ f2″ f3″ f
420

FIGURE 40a



a)

$n_1=1$	$n_{14}=1$	$n_{24}=3$
$\omega_{d\,1,1}\neq 0$	$\omega_{d14,1}=0$	$\omega_{d24}=\omega_{d24,1}=\omega_{d24,2}=\omega_{d24,3}=0$

Figure 40b

$\omega_{bm,n}\,t+\phi_{bm,n}=0$

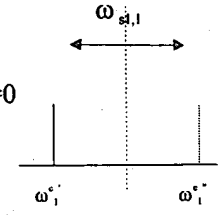


Figure 40d

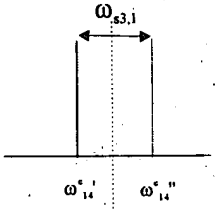


Figure 40f

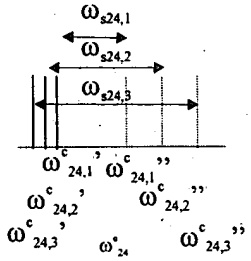


Figure 40c

$\omega_{bmn}\,t+\phi_{bmn}=\pi$

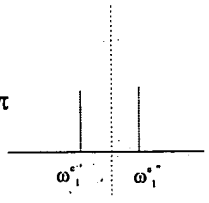


Figure 40e

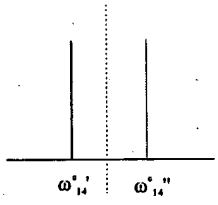
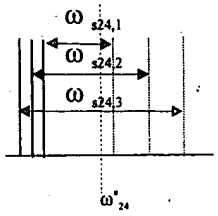


Figure 40g



c) e) g).

$$\omega_{bm,n}=\omega^{c}_{m,n}{}'-\omega^{c}_{m,n}{}''=\omega_{s\,m,n}+\omega_{d\,m,n}\cos(\omega_{m,n}\,t+\phi_{m,n})$$

FIGURE 41a

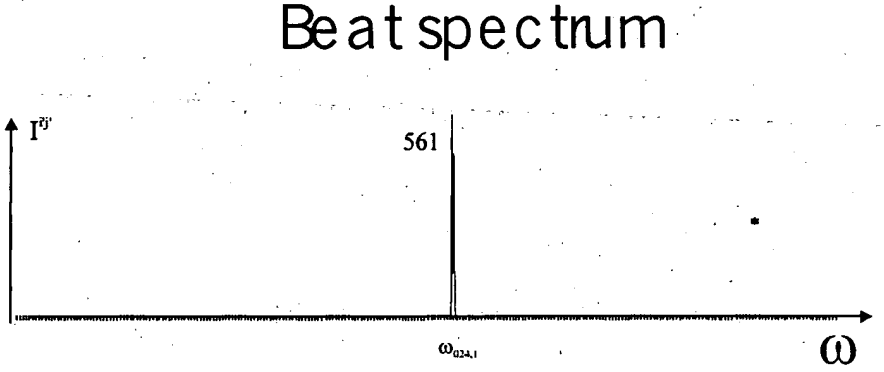


FIGURE 41b

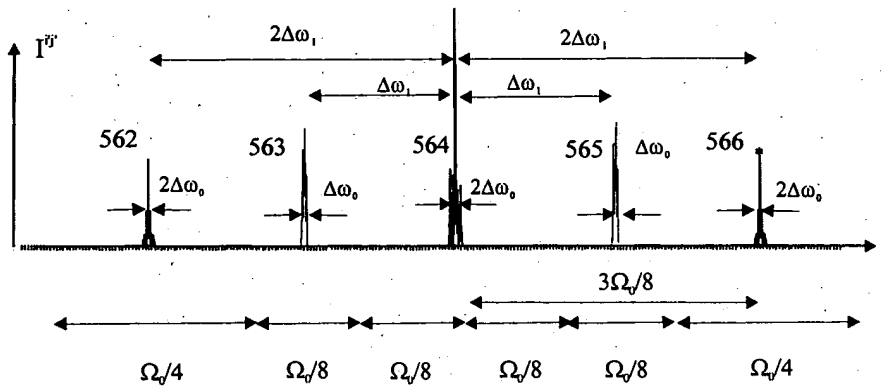


FIGURE 41c

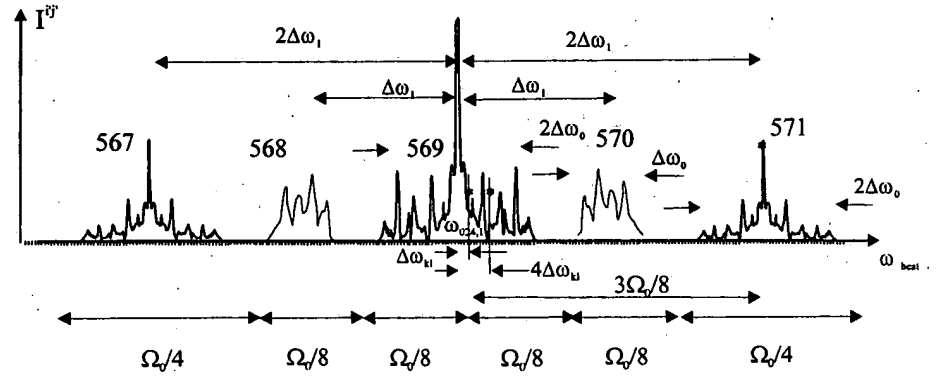


FIG URE 42a

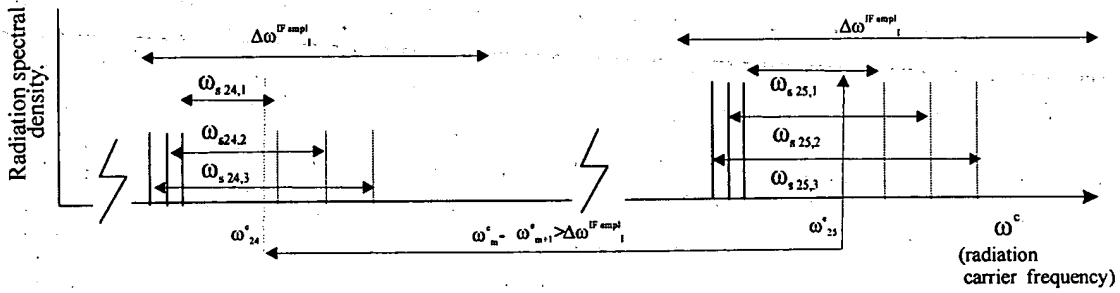
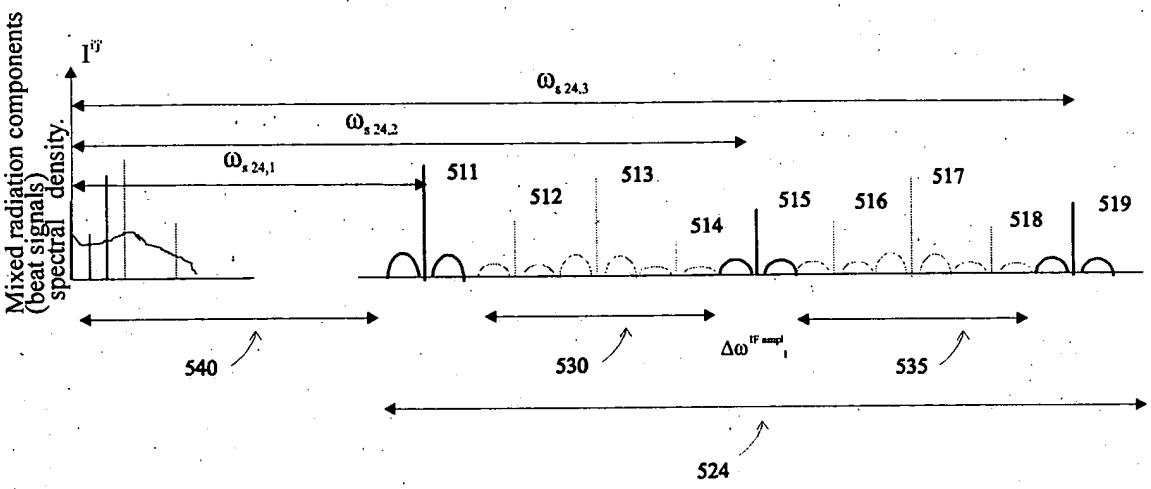


FIG URE 42b



b)

FIGURE 43

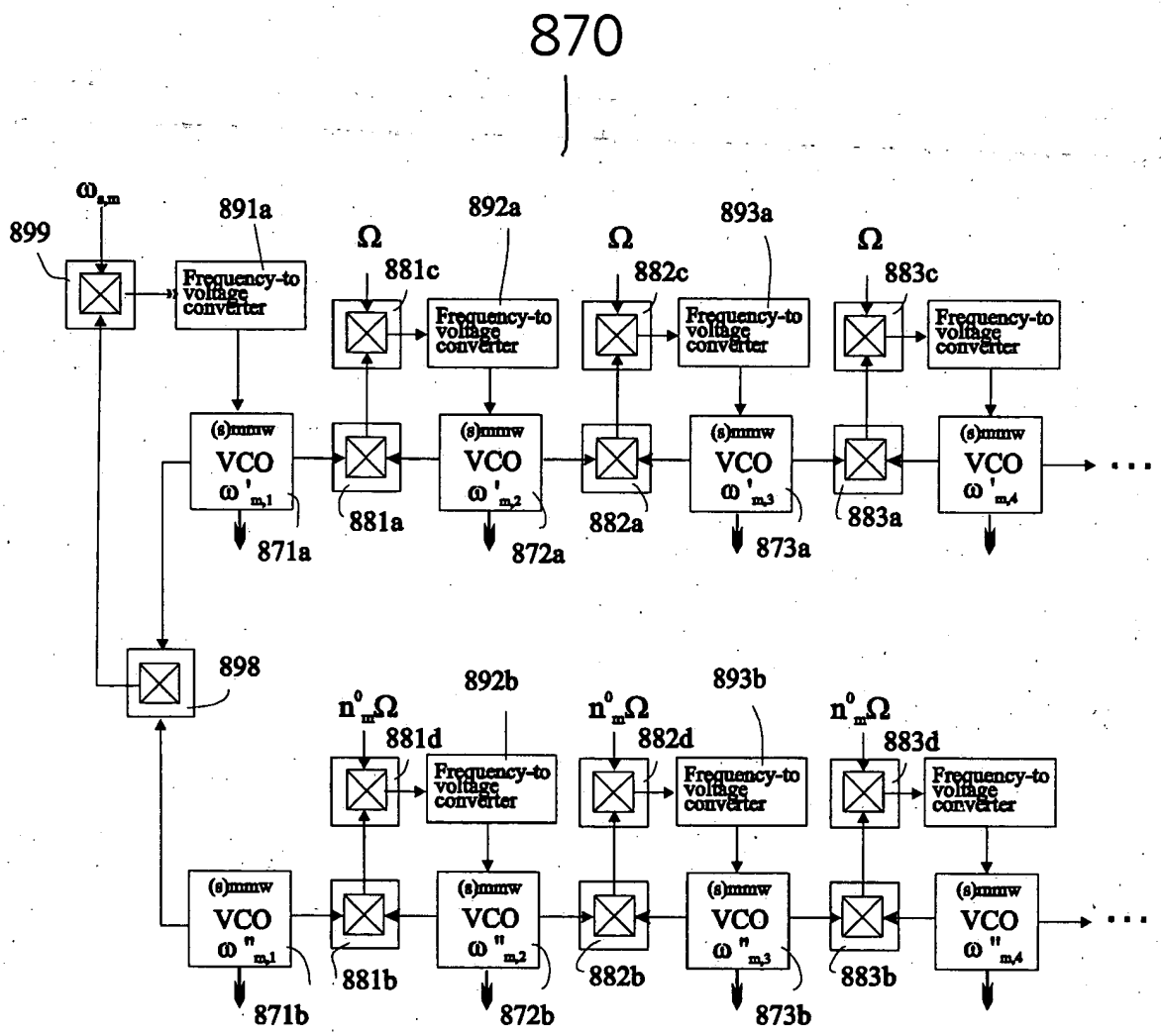

870
899
891a
892a
893a
Ω
881c
882c
883c
Frequency-to voltage converter
(s)mmw VCO
881a
882a
883a
871a
872a
873a
898
$n^0_m\Omega$
881d
882d
883d
892b
893b
881b
882b
883b
871b
872b
873b

FIGURE 44

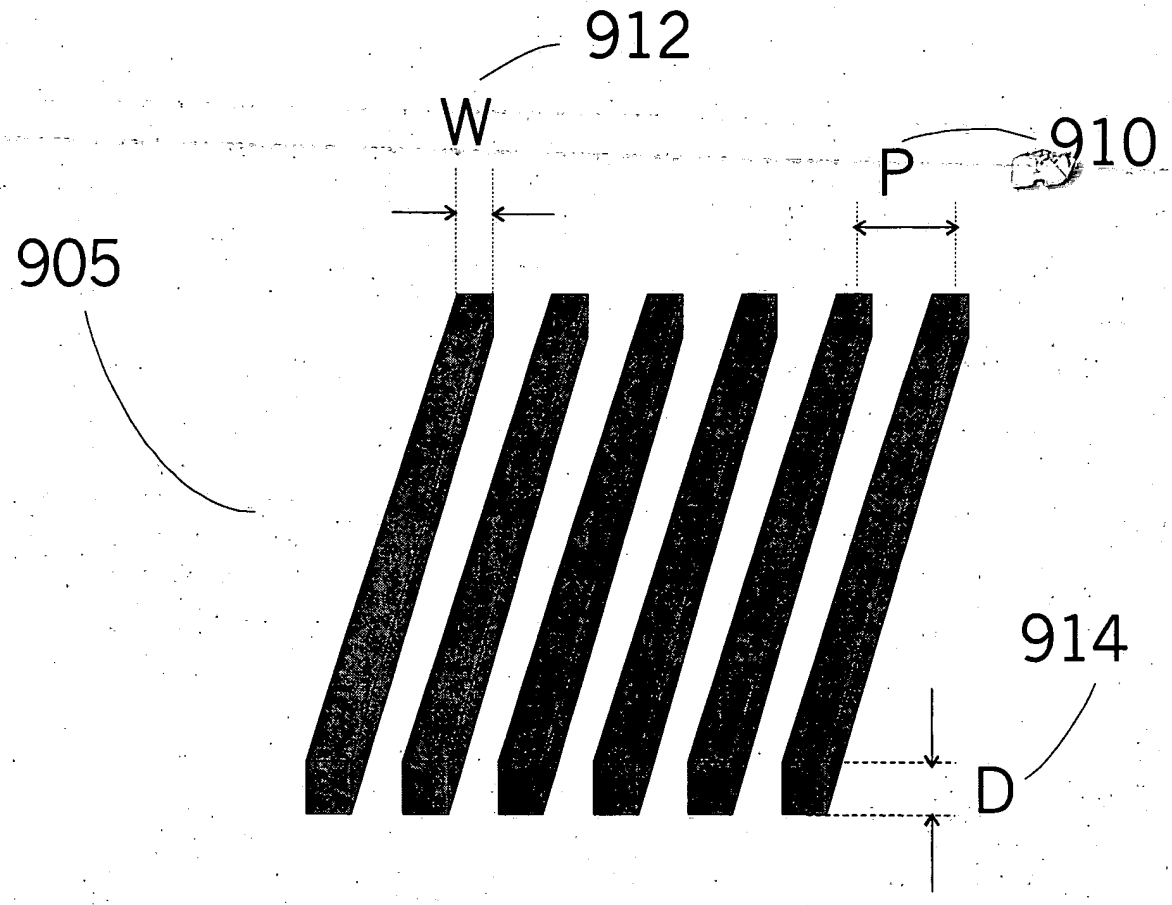


FIGURE 45a

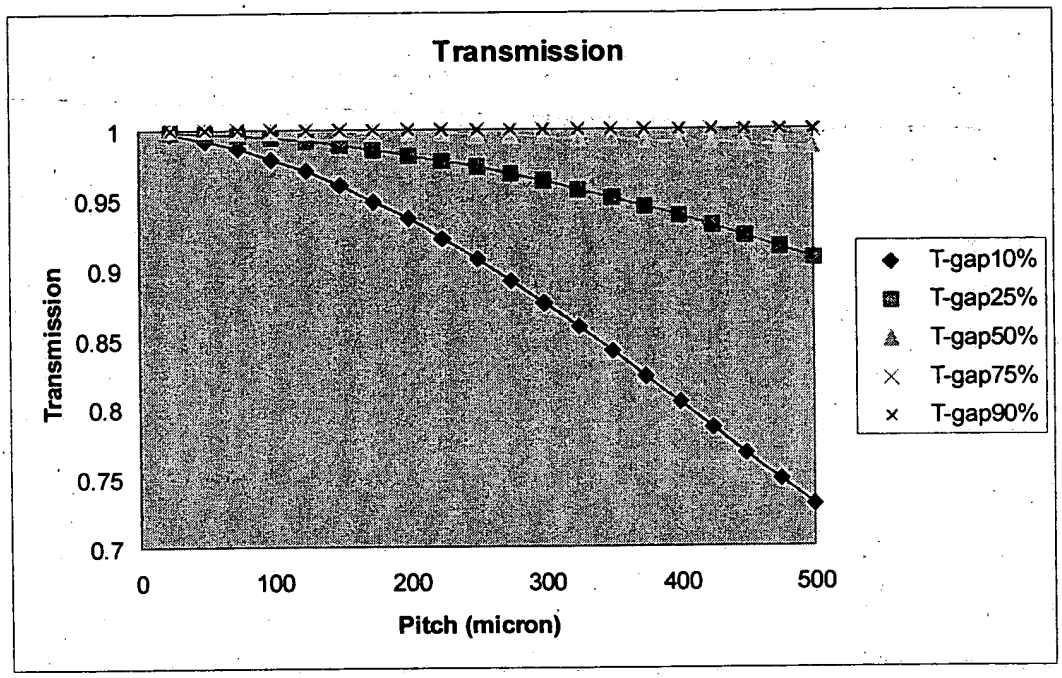


FIGURE 45b

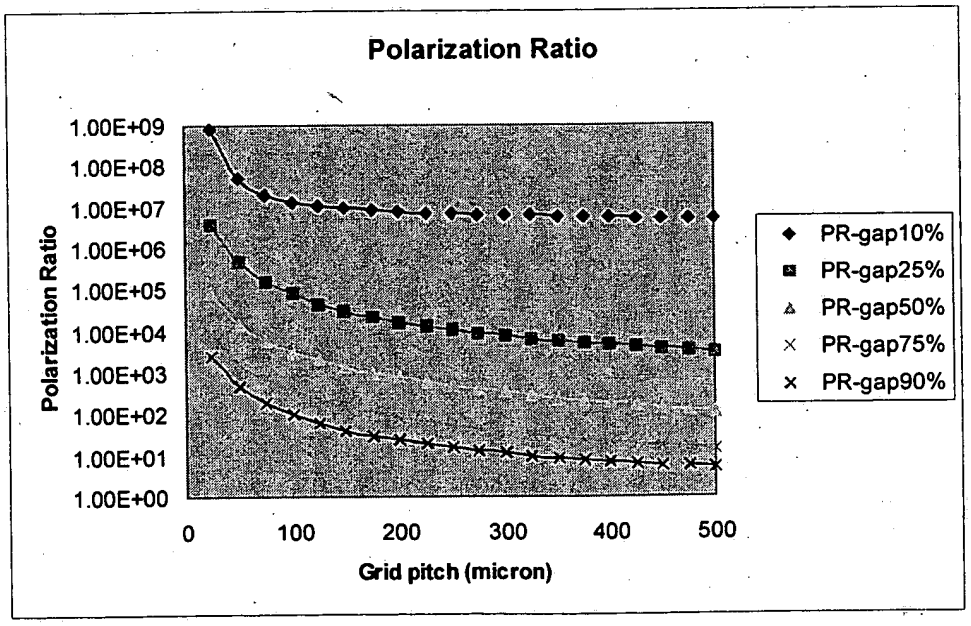


FIGURE 46a

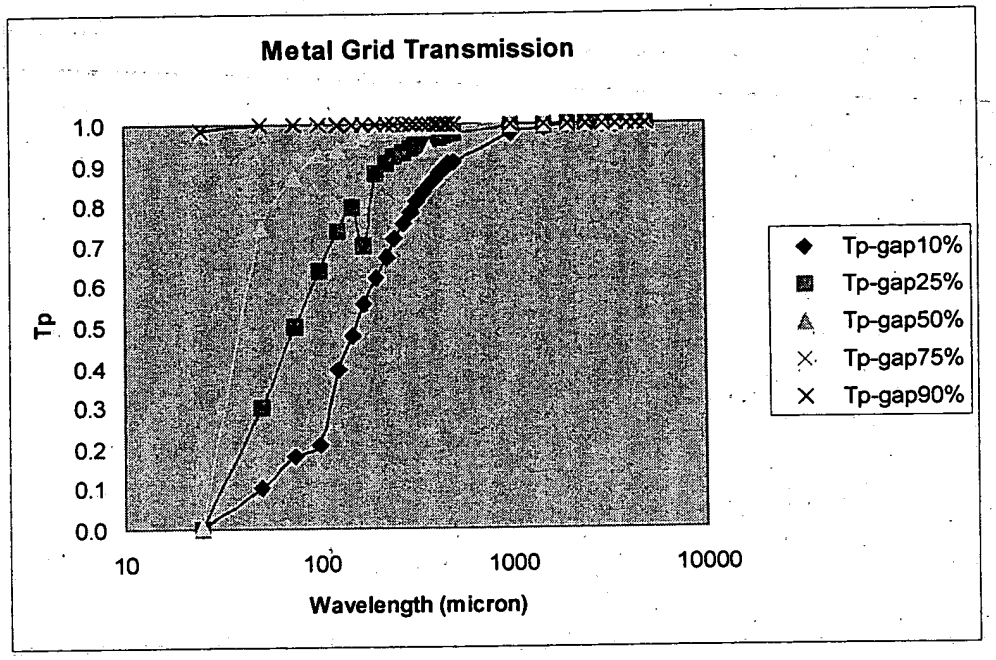


FIGURE 46b

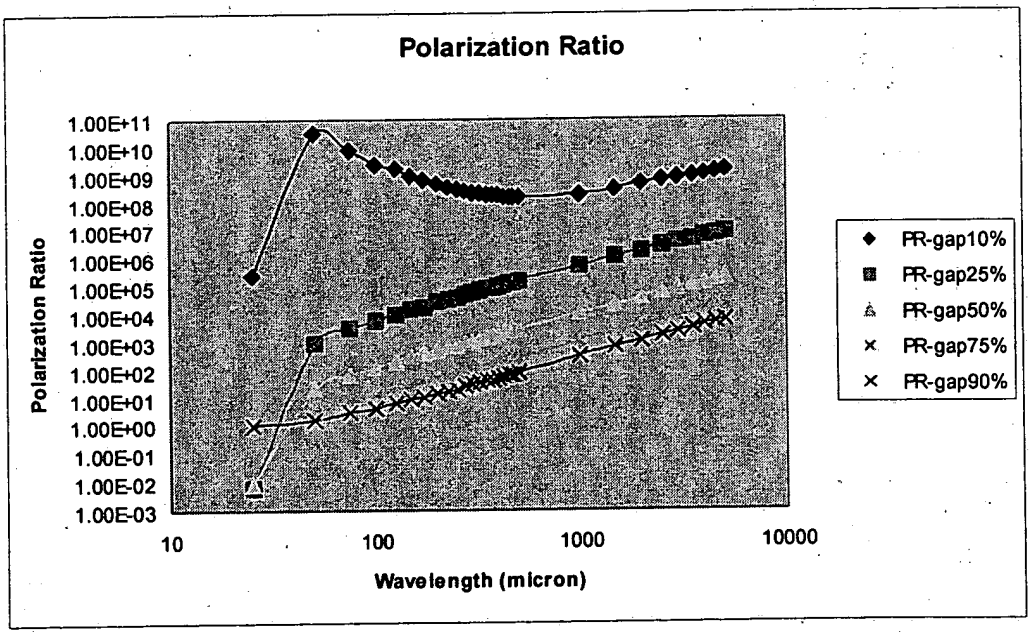


FIGURE 47

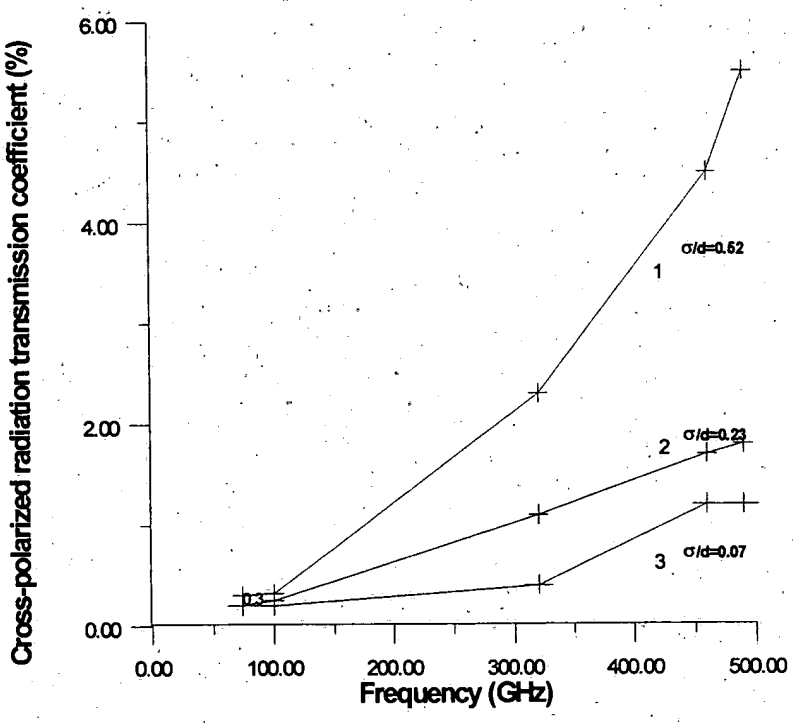

Cross-polarized radiation transmission coefficient (%)
6.00
4.00
2.00
0.00
0.00
100.00
200.00
300.00
400.00
500.00
Frequency (GHz)
σ/d=0.52
σ/d=0.23
σ/d=0.07
1
2
3

FIGURE 48a

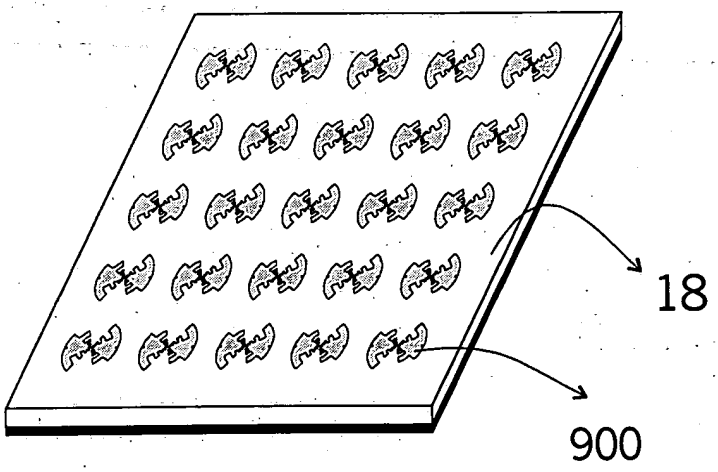


FIGURE 48b

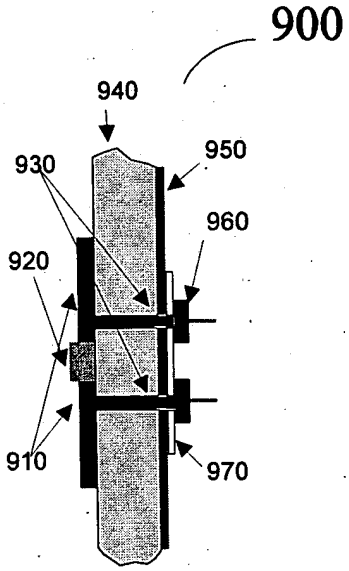


FIGURE 49a

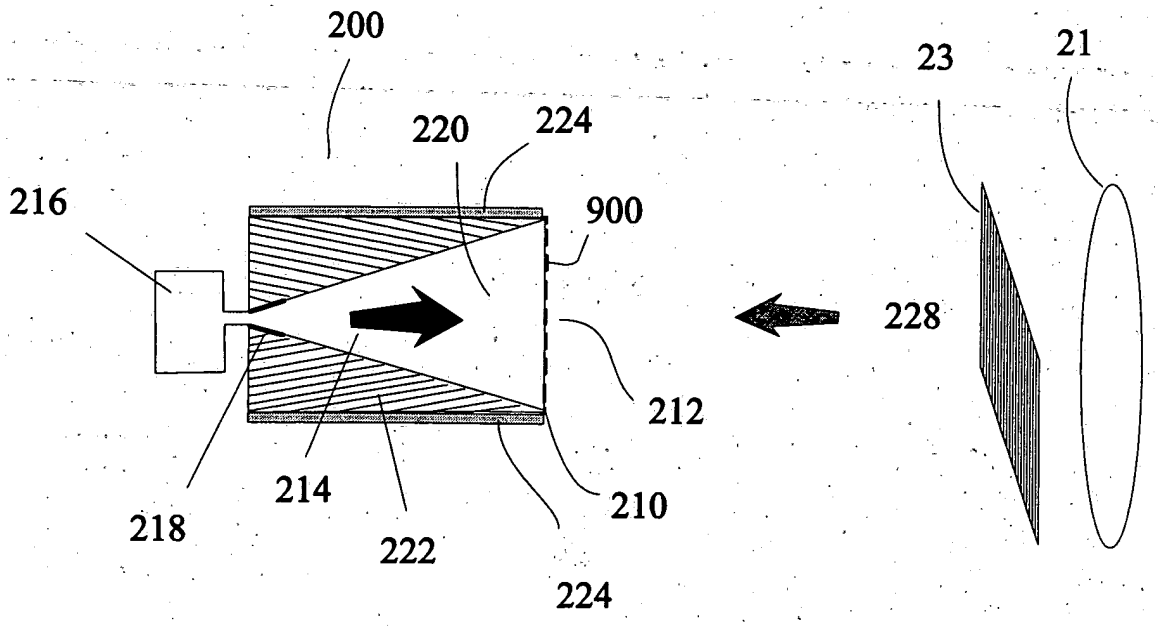


FIGURE 49b

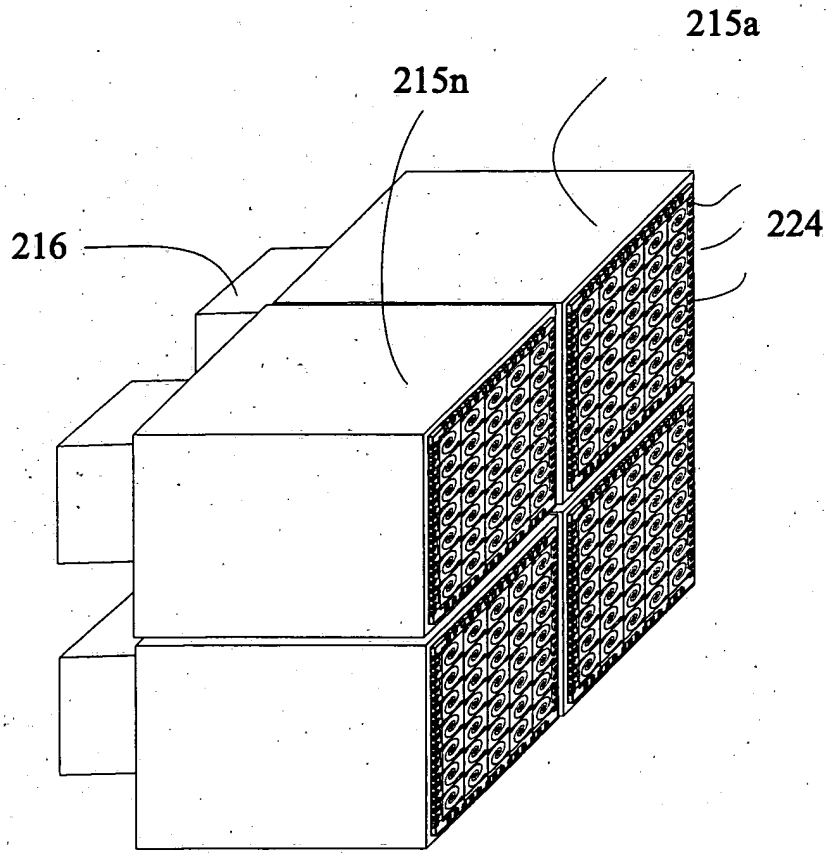


FIGURE 50a

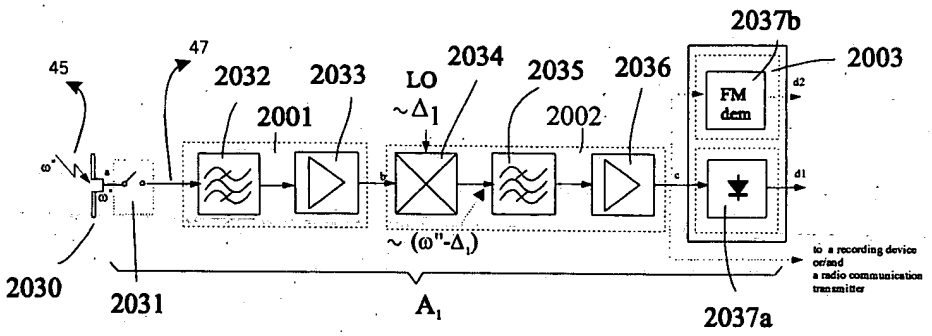


FIGURE 50b

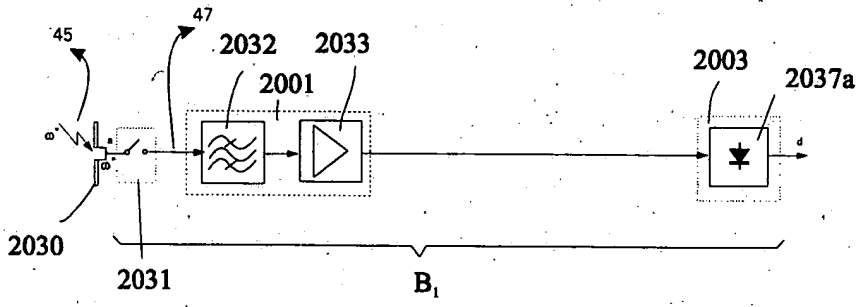


FIGURE 50c

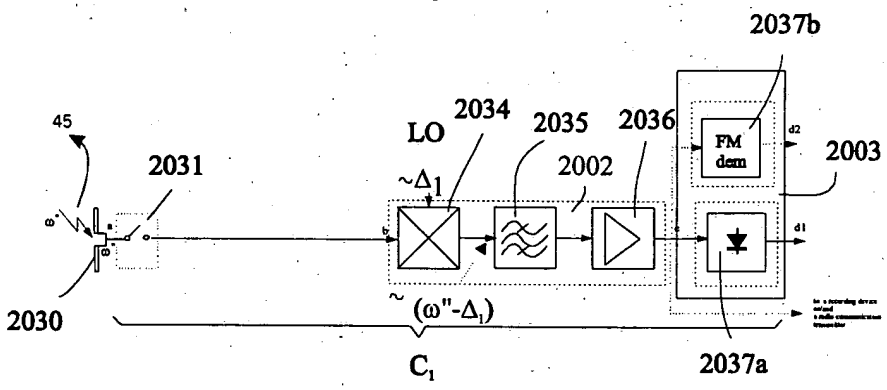


FIGURE 50d

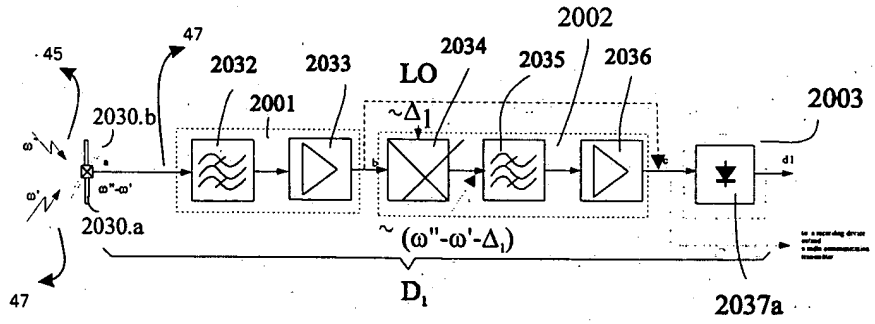


FIGURE 50e

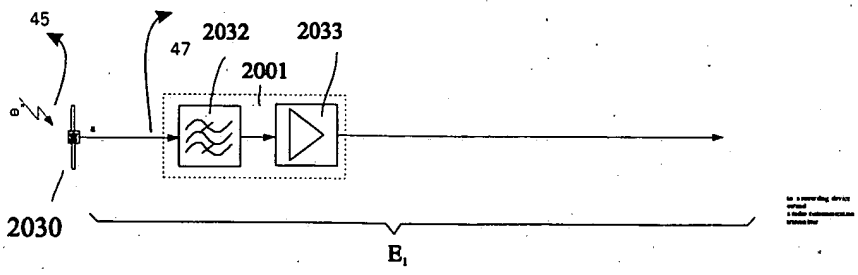


FIGURE 51a

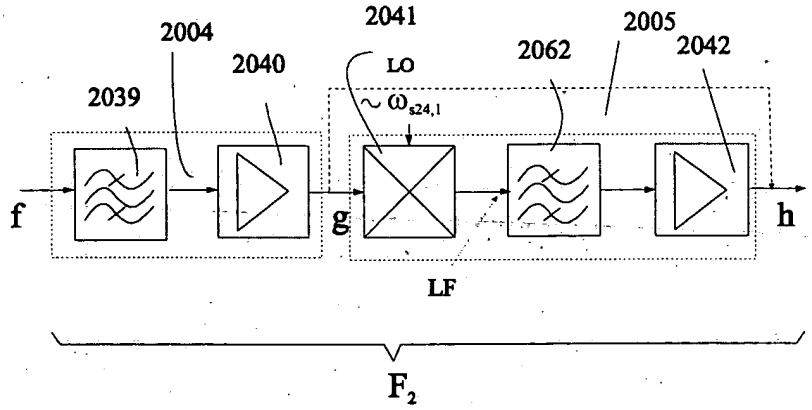
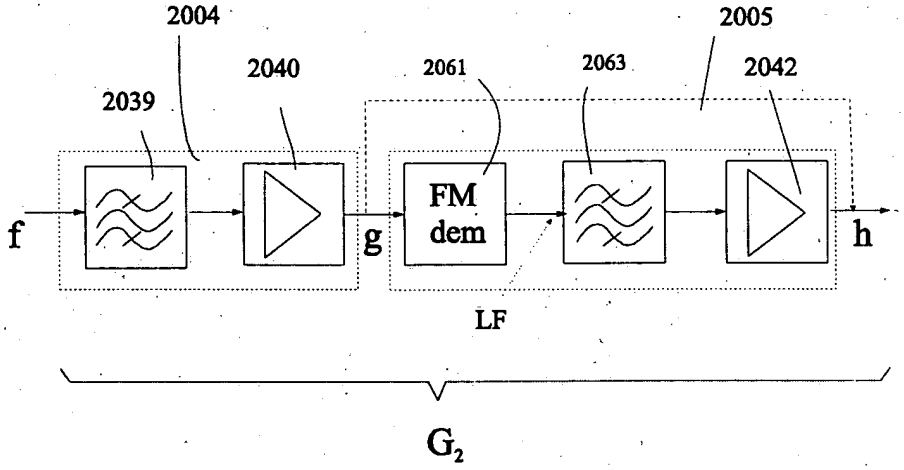


FIGURE 51b



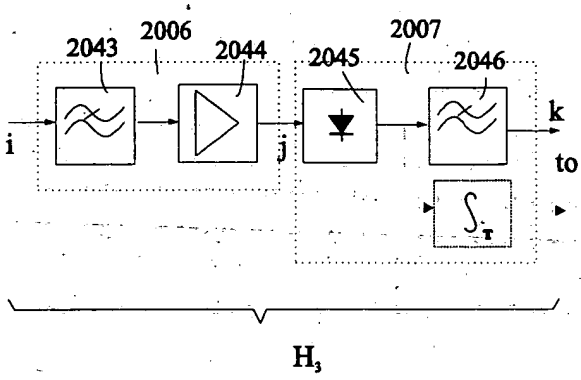


FIGURE 52a

to multiplexer 1 Fig.12

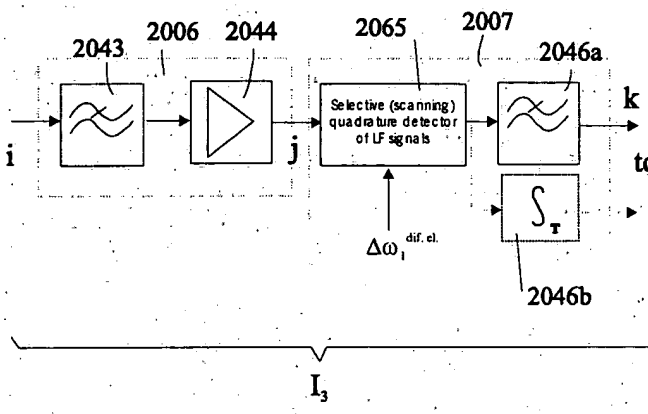


FIGURE 52b

to multiplexer 1 Fig.12

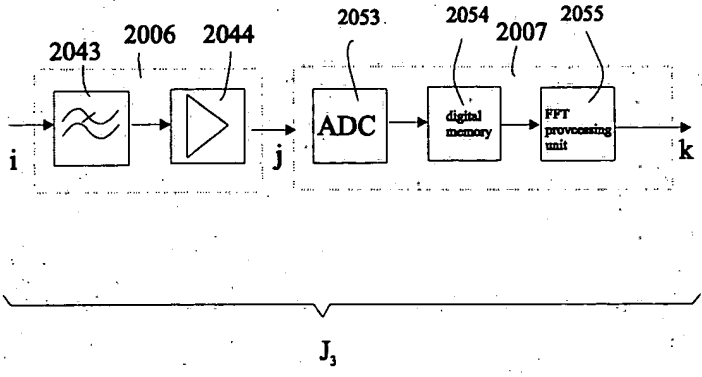


FIGURE 52c

to interface unit 12
1 Fig.12

FIGURE 53a

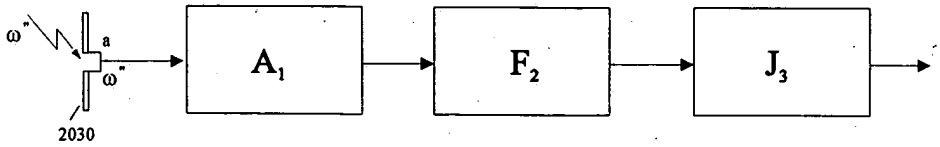


FIGURE 53b

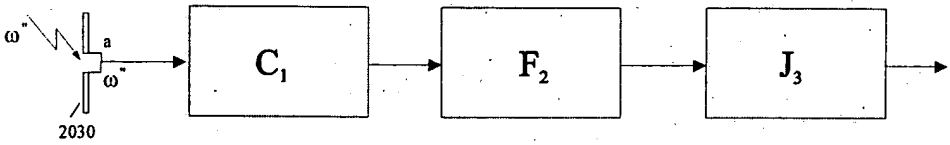


FIGURE 53c

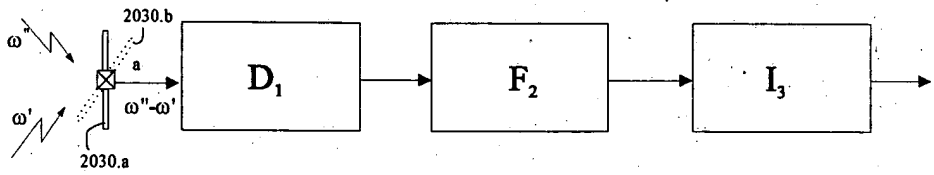


FIGURE 53d

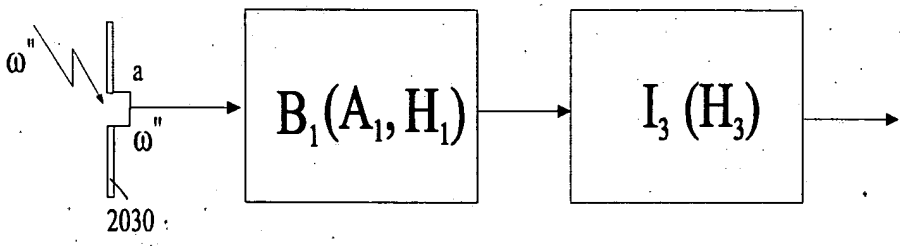


FIGURE 54

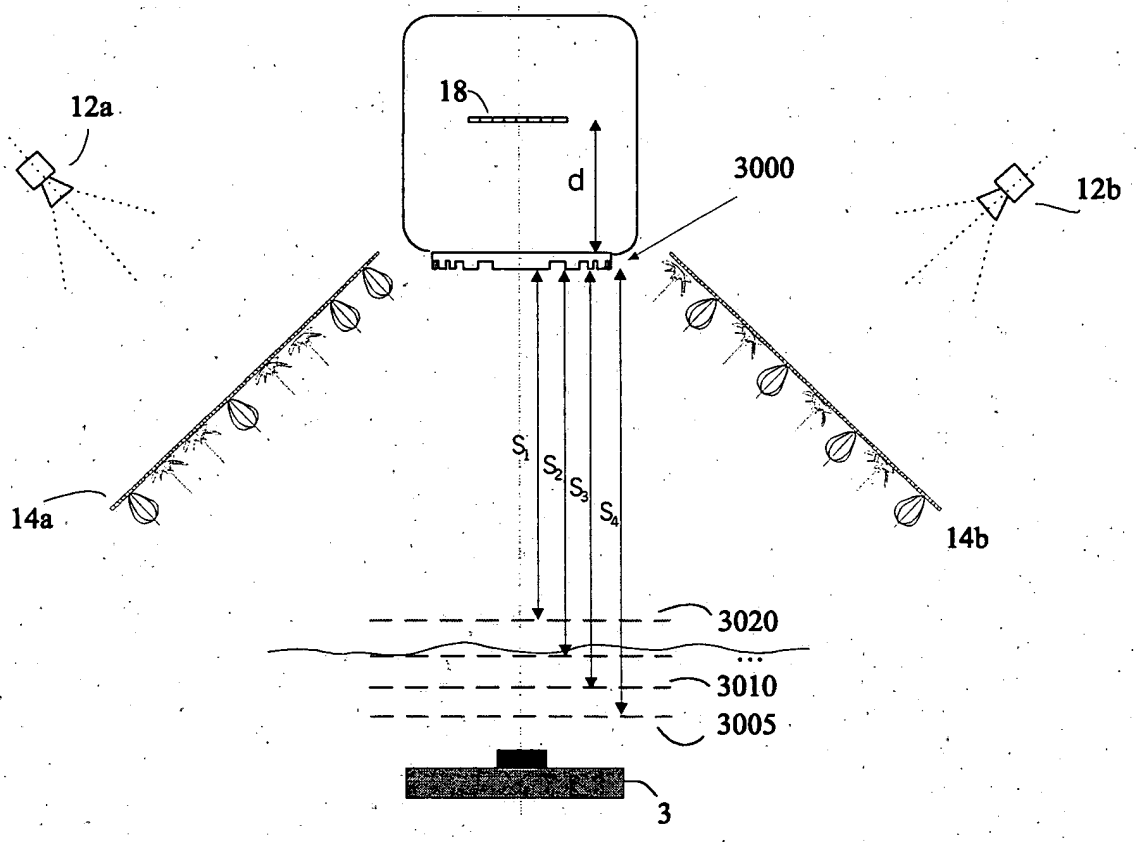
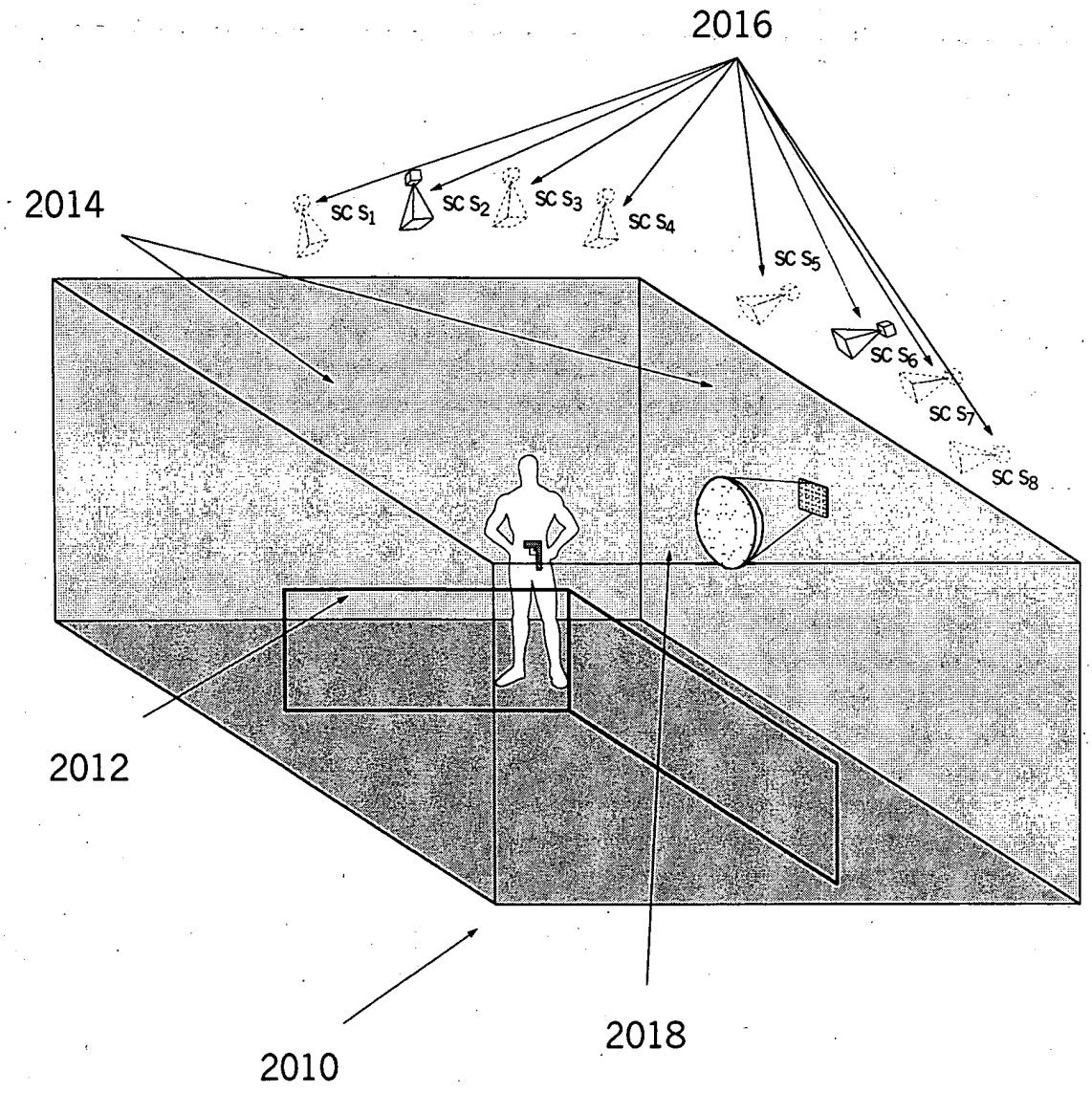


FIG URE 55


2016
2014
SC S1
SC S2
SC S3
SC S4
SC S5
SC S6
SC S7
SC S8
2012
2010
2018